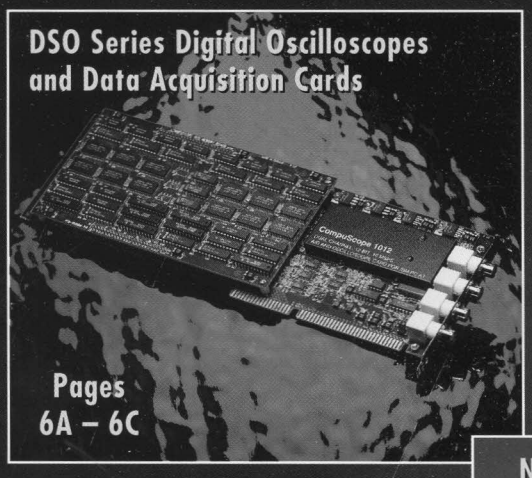
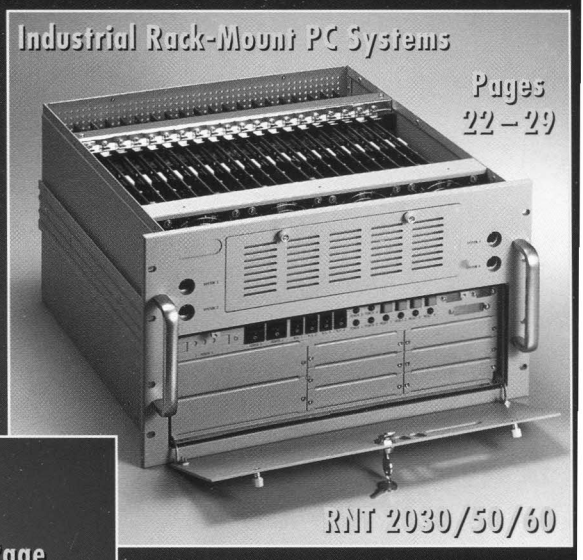
Special Edition:
Data Acquisition & Rack-Mount PCs

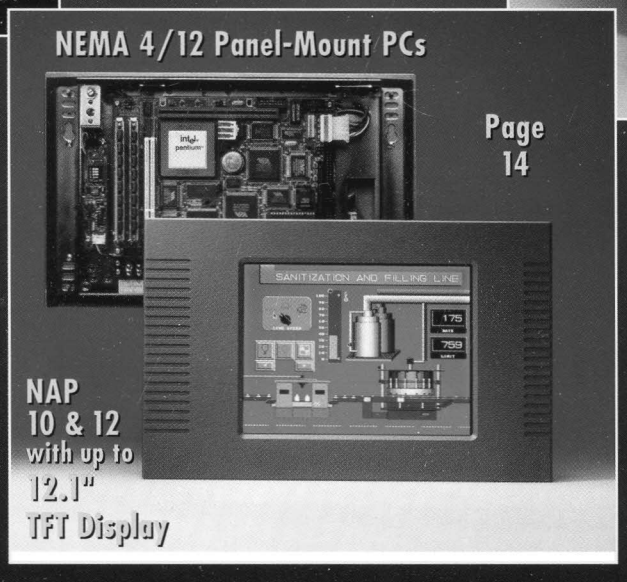
Save $ with COTS
Commercial Off-the-Shelf Technology

PC Systems Handbook
for Scientists and Engineers



- Rack-Mount PCs
- Data Acquisition
- Industrial Computers
- Communications
- Instrumentation
- PC-Based Solutions





- Computer Telephony
- Rugged Portable PCs
- MetraByte Compatibles
- Engineering Software
- Motion Control
- Digital I/O
- Analog Output

- Process Control
- PC/104 Modules
- PCMCIA
- RS-232/422/485
- IEEE-488/GPIB

CyberResearch

NEW!
INCLUDES CONTENTS
FROM 15-2 EDITION

INTERNET • BBS • Fax-on-Demand

NEW PRODUCT PREVIEW
1998 • NUMBER 15-1

More Products..More Choices

Sensory Overload. The PC industry is evolving at a staggering rate. More products..more choices. Less time to research the alternatives. To help you keep up, we just published our NEW 204-page *1998 Edition* of the *PC Systems Handbook*. Here are some of the 2000+ exciting products covered:

- **100+ Rack-Mount, MicroBox, & Portable PCs.**
- **100+ DAS Boards** with ***LabVIEW™ Drivers.***
- **100+ MetraByte™-Compatible** Boards.
- **New PCI-bus Data Acquisition Boards**
- **PC-based Motion Control.**
- **Plus many more new items.**

CyberResearch has been the leader in the application of personal computers for data acquisition and instrumentation since 1983. By being the first to bring you the latest products at the lowest prices, we'll keep you on the crest of the technology wave.

Give us a call today. We're looking forward to working with you on your next PC-based systems project.

Sincerely,

Robert C. Molloy
Founder & President

P.S. Take a minute right now to ensure that your free *PC Systems Handbook* updates keep coming – simply fill out & return the enclosed qualification form.

Special Discounts for Quantity Buyers, OEMs, & Resellers.

The PC Price/Performance Wars Continue

New products are being announced on a regular basis which offer enhanced performance at lower prices. Call or Fax your request for a quotation listing brand names, part numbers, and/or performance requirements. *If you require large quantities ask for our new OEM Department.* We will respond promptly with detailed product specifications and pricing. Thank you.

How CyberResearch On-Line Makes Your Life a Little Easier

☑ ***Free Applications Engineering*** (9AM–5PM Eastern Time)
800-341-2525 (USA) ***203-483-8815 (INT'L)***

Our experienced Application Engineers will help you make sense of competing claims and select the one product that best meets your needs, at the lowest price. CyberResearch is the *factory-authorized*, one-stop shopping source for over 100 leading suppliers. As a result, we can provide you with unique, multi-vendor "open system" solutions that are not available from any single manufacturer. With approved credit, we offer *same day shipment* on orders received by 2:00 PM for items from our extensive inventory. Please call for a quotation.

☑ ***24 Hour Fax-on-Demand Service***
203-483-9966 (USA) ***FAX 203-483-9024 (INT'L)***

Get in-depth product information 24 hours-a-day right from your Fax machine — with our fully-automated Fax-on-Demand System. Here's how it works: Call 203-483-9966. We will fax you a list of available documents. Enter the document code and our system will fax it to you (3 document limit per call). **International customers** send your information request via e-mail (info@cyberresearch.com) or in writing via Fax and we will respond via Fax.

☑ ***24-Hour BBS Bulletin Board System***
203-488-8949 (USA) ***203-488-8949 (INT'L)***

Down-load FREE software demo versions from the leading developers of Windows-based data acquisition, control, and engineering software.

☑ ***Internet World Wide Web Site***
http://www.cyberresearch.com/

Explore this valuable new cyber-resource for the engineering and scientific community — includes FREE product information and software demos.

NEW: Visit our home page to order the latest CyberResearch FAX-on-Demand Documents.

The CyberResearch 100% Satisfaction Guarantee

You can order from CyberResearch with confidence. If you are not completely satisfied with your purchase, simply call our toll-free hotline within 30 days of receiving the item. A friendly customer service technician will arrange for a full refund, replacement, exchange, or credit. **No problem. No hassle.**

A 15% Restocking Charge will be applied to all exported product returns.

We reserve the right to refuse returns in the following cases:

Special order items: This refers to any items not currently listed in our Handbook, but specially requested by you.

Quantity, discount, dealer or OEM sales: If you are purchasing a large quantity of an item, we assume that you have previously evaluated its suitability.

Items which have been damaged or defaced.

© Copyright 1997, CyberResearch, Inc., Branford, CT USA All Rights Reserved

CyberResearch

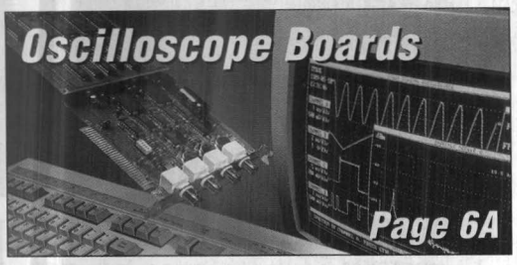
PC Systems Handbook

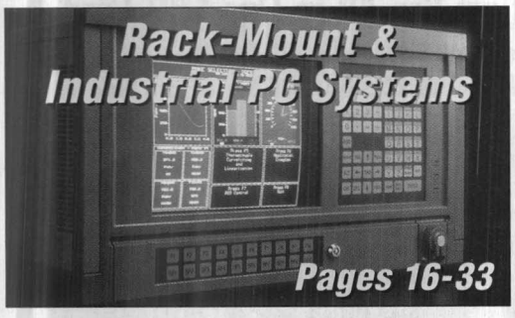
for Scientists and Engineers

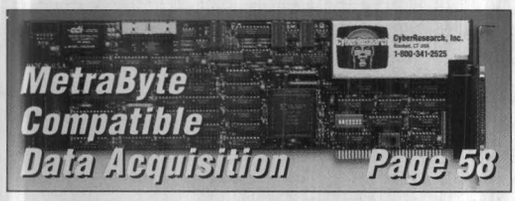
1998 New Product Preview Number 15-2

For Information on CyberResearch Products which are not Described in this Edition

Fax or Call for a FREE 212-Page Handbook. Call our 24-Hour Fax-on-Demand Service for Individual Data Sheets. Call our Toll-Free Hotline for Application Assistance.







New Products

☆ Late-Breaking New Industrial PC Products....4A
☆ N1L 5 Series Low-Profile Rack-Mt. PC Chassis....4B
☆ NBL Portable PC with 8 PCI/ISA Slots....5A
☆ New Portable & Notebook PC Systems....5B
☆ 8-Bit Digital Scope Boards – 40 to 250MHz A/D....6A
☆ Ultra High-Speed 12-Bit DAS Boards to 100MHz...6B
☆ GageScope™ Digital Oscilloscope Software....6C
☆ 64-Channel Data Acquisition Bd: CYDAS 6400....6D
☆ Digital Multimeter & Waveform Synth. Boards....7A
☆ ADAM Remote Data Acquisition Modules....7B
☆ *INSTRUNET*™ DAS System: Precision 14-Bit A/D....8

PC Systems

☆ NEMA 4/12 Industrial Panel-Mount PC Systems....10
☆ SuperTrim™ MMX 12.1" TFT Panel-Mount PCs....11
☆ High Performance Flat-Screen TFT LCD Monitors..12
☆ Flat-Screen Panel PCs & LCD Monitors....13
☆ Rack-Mount 14" to 20" Monitors....14
NEMA 4/12 Large Screen Rack-Mount Monitors....15
☆ VRK & VTK Rack-Mt. PCs w/built-in Keyboards....16
☆ VRC Rack-Mount PC Systems w/VGA Monitors....17
☆ NEMA 4/12 Industrial Workstations....18
☆ Panel & Rack-Mount NEMA 4/12 Workstations....20
14-Slot Industrial Workstations with Monitors....21
☆ MicroBox™ Compact Industrial PC Chassis....22
☆ 14-Slot Industrial Rack-Mount PC Chassis....26
☆ 20-Slot PCs w/Redundant Power Supplies....30
☆ Rack-Mt. PCs with Hot Swap Power Supplies....32
☆ Motherboards – Pentium II, Pro, MMX, & more....34
☆ Passive Backplanes with PCI & ISA Slots....35
☆ Pentium II, Pro, & MMX "All-in-One" CPU Cards...36
☆ "All-in-One" Pentium & '486 Plug-in CPU Cards....38
☆ Rack-Mount PC Chassis Comparison Chart....39

PC Accessories

☆ Power Supplies, UPSs, Surge Protectors....40
☆ Watchdog Timer Boards, Dual Fan Card....40
☆ Rack-Mount & Compact Desktop Keyboards....41
☆ PC Expansion Chassis & Bus Extender Card Sets...42
☆ DiskOnChip®, Anti-Vibration HDD Chassis....42
Monitor/Keyboard/Mouse Extenders – 0 to 250 ft...43
Removable Hard Drive Modules, Printers....43
Hard Drives, CD-ROM Drives, & SCSI Controllers..43

Data Acquisition

☆ Data Acquisition Comparison Charts....44
☆ PowerDAQ™ PCI-Bus 16 & 64-Channel A/D Bds....48
PCL 812 & 818 Low-Cost Data Acq. Boards....50
DynaRes™ High-Accuracy A/D for Temperature....52
UPC-Series Direct Sensor Input Boards....53
PC 30 Series Multi-Function DAS Boards....54
☆ WIN 10/30 High-Speed Data Acquisition Boards...55
HSDAS & LSDAS High-Speed A/D Boards....56
☆ AAF Precision Anti-Aliasing Filter Boards....57

MetraByte Compatibles

☆ *CYDAS*™ Data Acquisition Boards....58
Universal Driver Library & LabVIEW® Drivers....60
VI Components Virtual Interface Library....61
☆ HP VEE Data Acquisition & Analysis Software....61
☆ CYDAS 1400 & 1600 Multi-Function A/D Boards....62
CYDAS Terminal Panels and Cabling....64

Analog Output

☆ Analog Output (D/A) Board Comparison Chart....68
ACAO & PCL-Series Analog Output Boards....69
CYDAC & CYDDA Analog Output Boards....70

Digital I/O

☆ Digital I/O Boards Comparison Chart....72
MetraByte-Compatible Digital I/O Accessories....73
☆ Counter/Timer Boards with 5, 10, or 20 Counters..74
CYERB & CYSSR Relay Panels & Mounting Racks..75

Engineering Software

☆ Data Acquisition, Analysis, and Control Software ..76

GPIB / IEEE-488

TestPoint™ Software....78
INST 2000 GPIB/IEEE-488 Interface Cards....79
☆ GPIB Interfaces for PCI, ISA, PC/104, & PCMCIA...80
☆ IEEE-488/GPIB Cabling & Wiring Accessories....82

Communication

☆ High-Perf. Serial & Current Loop Interface Cards..83
☆ RS-422/RS-485: 1, 2, & 4-Port Serial Cards....84
Serial Interface Converters & Surge Protectors....86

Motion Control

☆ Complete Motion Systems....88
☆ Stepping Motor Controller Cards....89
Low-Cost Complete Motion Control Systems....90
Positioning Slides and Tables....91
☆ Panther Integrated Microstepping Drivers....92
All-in-One Intelligent Stepping Motor Drivers....93
Microstepping & Bipolar Chopper Motor Drivers...94
☆ DC Power Supplies for Motion Systems....95
Stepping Motors....96
☆ Quadrature Encoder Input Boards....97

Ordering Information

Terms and Conditions & Satisfaction Guarantee....98
Ordering Information....99

☆ ☆ ☆ **Red Stars Indicate New Products & Features**

FREE **PC Systems Handbook for Scientists and Engineers**

NEW 1998 Edition • 212 Pages • Fax or Call for Your FREE Copy Today

The **CyberResearch PC Systems Handbook** describes over 2000 unique and hard-to-find items for PC-based engineering. Packed with useful technical information and easy-to-read diagrams, this invaluable reference should be part of every engineer's library. **Fax, call, or write for a complimentary copy.**

Be Sure to Receive the NEW 1998 Edition — Return Your Reply Card Today!

(add suffix –WHITE to part#). #NIL 5CP PCI-Bus: $595

NEW!

Exciting New PC Solutions from CyberResearch!

6-Slot MicroBox Chassis

MB IPC6RM

130W Power Supply
Two 3.5" Drive Bays
Fan Cooling

FOD#2326

See page 24

10.6" x 6.8" x 11.4"

$275

Use with an All-in-One™ Half-Size CPU Card – page 38

8 or 10-Slot MicroBox

MB IFC8N
MB IFC10N

External access to one 3.5" floppy and one 5.25" drive, plus one internal 3.5" drive bay

250W Power Supply

FOD#2318

13" x 6.8" x 16"

From $400

Wall or Benchtop-Mount for use with ISA/PCI Backplanes or Baby AT Motherboards
Supports Full-Length/Full-Size PC Cards

6 to 14-Slot Card Cage

MB CC6N — 6 Slots / 7.5" x 6.5" x 14.5" $275
MB CC8N — 8 Slots / 10.6" x 6.5" x 14.5" $295
MB CC14N — 14 Slots / 14.2" x 6.5" x 14.5" $350

See pp. 22-25

Room for one External 3.5" Drive

FOD#2341

From $300

Wall or Benchtop-Mount Card Cage for use with ISA & PCI Backplanes/Baby AT
Supports Full-Length/Full-Size PC Cards

Rack-Mt 14", 15", 17" & 20" Color Monitors

GRX NEMA 1 Monitors

FOD#2410

From $895 Page 14

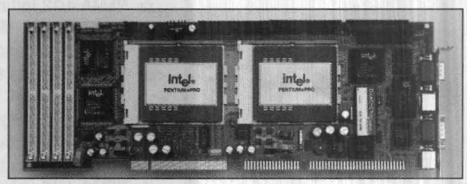
GRM NEMA 4 Monitors

FOD#2415

From $1495 Page 15

Dual Pentium Pro All-in-One CPU Card

200MHz PCI/ISA • 440FX Chipset • 32MB RAM • 512K Cache
Built-In Socket for DiskOnChip Solid-State Flash Disk



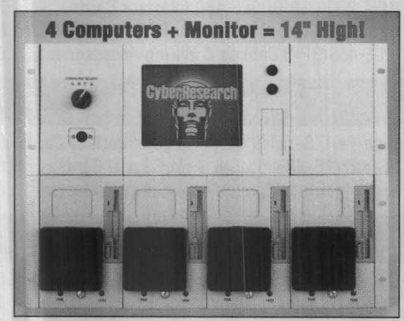
#CPRL PR2-200

See page 36

FOD#2641

Only $2995 Complete!

RNC Rack-Mount Node PC Chassis



4 & 8-Slot Passive Backplanes with Switchable CRT Monitor that you can share between Multiple PCs

Modular components allow four independent 4-slot PCs to be installed in only 7" of vertical rack space. Call our Fax-on-Demand system for details.

Ordering Information: ***Passive Backplane units require an All-in-One CPU card.**

Rack-Mount Node Computers See pp. 36-38 for '486 & Pentium CPU Cards

#RNC 4 Rack-Mt Node Computer 4-Slot* passive backplane, 65W.....**$350**
#RNC 8 Rack-Mt Node Computer 8-Slot* passive backplane, 150W....**$595**
#RNC 7M 7" Monochrome VGA CRT Monitor with A/B/C/D Selector switch..**$635**
#RNC 7K 7" Rack-Mount Chassis Kit to Mount Node Computers **$120**

***A quantity of four RNC 4, two RNC 8, two RNC 7M, or combinations such as two RNC 4s & one RNC 7M will fit in a 7-inch high RNC 7K 19-inch rack chassis kit.**

Add $30 for Filler Panels if required. CPU Cards & accessories are shown on pp. 36-38.
Note: #MSI 01055 1.44MB 3.5" Floppy Drive optional: $59. See Hard Drives on pg 43.

For details call our Fax-on-Demand system 203-483-9966 FOD#2025 & 26

PMR 10T Panel-Mount PC • 7 HALF Slot ISA

FOD#2210

10.4" TFT Active Matrix Flat-Screen LCD Color Display

Features: passive backplane with 7 half-length slots, 0 to 45°C, optional touch screen, space for 3.5" floppy & hard disk, 25 CFM cooling fan, hold-down clamp for cards. 12.6"**W** x 10.8"**H** x 7.5"**D**.

#PMR 10T 10.4" Color TFT LCD Rack-Mt. PC, 7 Half-Length **ISA** Slots...**$2995**
Add **–T** Suffix to N1R Rack-Mt PC Part Number for **optional Touch Screen** **$500**

Note: Includes a 3.5" 1.44MB FDD, ISA VGA Card, 65W Power Supply. For accessories see page 40 including: floppy & hard drives, rack-mt. keybds, printers, surge protectors, UPSs, etc.

Long-Life 12 VDC FIELD POWER PACK™

With the **BAT 1040** you can operate your notebook & docking station in the field up to 9 hours at a 48-Watt draw (40 Amp-hours)!

FOD#2356

#BAT 1017 Field Power Pack 12VDC 17Amp-hr Power Supply w/AC Charger...**$395**
#BAT 1040 Field Power Pack 12VDC 40Amp-hr Power Supply w/AC Charger...**$895**
#NBE 6148 12VDC to 115 VAC 140-Watt Power Converter.....**$195**
#BAT 1000C Optional 6-ft DC Extension Cord (Lighter Plug M-F Cable) **$20**

BAT 1017: 10.5"**W** x 3.3"**H** x 10"**D** **Weight: 16 lbs.** • **BAT 1040:** 13.5"**W** x 7"**H** x 11.5"**D** **Weight: 38 lbs.**

Ask for FOD#2000 for a Directory of PC Systems Fax-on-Demand Documents.

CyberResearch Assistance: Toll-Free 1-800-341-2525 (USA) ☎ Tel: 203-483-8815 Fax: 203-483-9024
Applications Engineers: Mon-Fri, 9 AM-5 PM U.S. Eastern Time • **Internet Website:** http://www.cyberresearch.com • **Fax-on-Demand System:** 203-483-9966 • **BBS:** 203-488-8949

BTC 10T: NEMA 1 Benchtop PC System
10.4" TFT Display with 5x86 or Pentium CPU
Built-in Resistive Touch Screen Standard

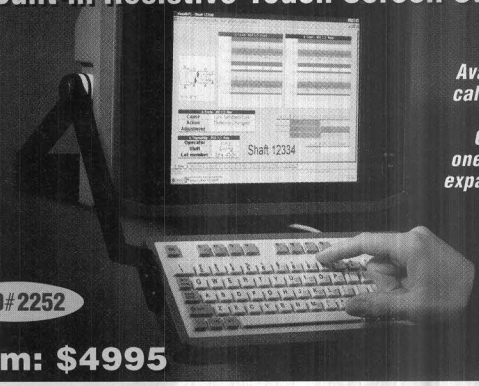
Available soon – call for details.

FOD#2253

From: $3295

High Bright TFT Color 200 nits (200 cd/m²)!

WTC 11: NEMA 12 Wall-Mt PC System
11.3" TFT Display with 5x86 or Pentium CPU
Built-in Resistive Touch Screen Standard



Available soon, call for details.

One 8-bit and one 16-bit internal expansion card slots

FOD#2252

From: $4995

Rugged Enclosure Ideal for Factory Floor Applications

New Family of Pointing Devices for Windows 95®

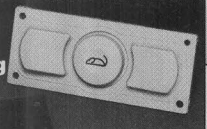
CyberResearch offers a wide variety of keyboards and seamless mouse pointing devices including: touch-pad, track-ball, GlidePoint™, joystick, Hulapoint™, and waterproof models.

OIX 2011G Benchtop Keyboard

FOD#2805

Only $225 – see page 41

OIX 4421 & OIX 4422 OEM Pointing Devices



Only $169 (requires a special interconnect cable – call).

New OEM Mouse-Button and Mini-Joystick Pointing Devices. They only require 0.25" of mounting depth! Call for details.

FOD#2822

Ordering Information: ***Call Fax-on-Demand for more information***

#OIX 2011G	Benchtop Keypad with GlidePoint™	**$225**
#OIX 4421	OEM Miniature Mouse-Button™ Pointing Device	**$169**
#OIX 4422	OEM Mini-JoyStick™ Pointing Device (Black)	**$169**

TFT LCD Flat Panel Color Monitor with Touch Screen

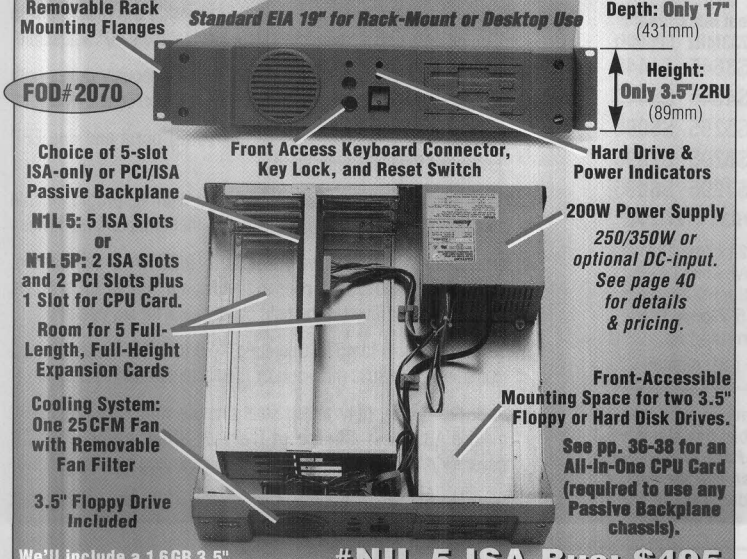
CyberResearch offers a wide selection of high-performance monochrome & color flat-panel monitors which can be used as alternatives to CRTs. They feature: compact size, light weight, thin profile (less than 2 inches thick), low power consumption, & rugged panel, wall, or rack-mount enclosures.

Ordering Information: ***See page 12 for detailed information***

#GDT 10	10.4" Color TFT LCD Monitor 640x480	**$1895**
#GDT 10T	10.4" Color TFT LCD Monitor 640x480 w/Touch Screen	**$2195**
#GDT 12	12.1" Color TFT LCD Monitor 1024x768 XVGA	**$2995**

N1L 5: Low-Profile 5-Slot 2RU Rack-Mt PC

FOD#2070

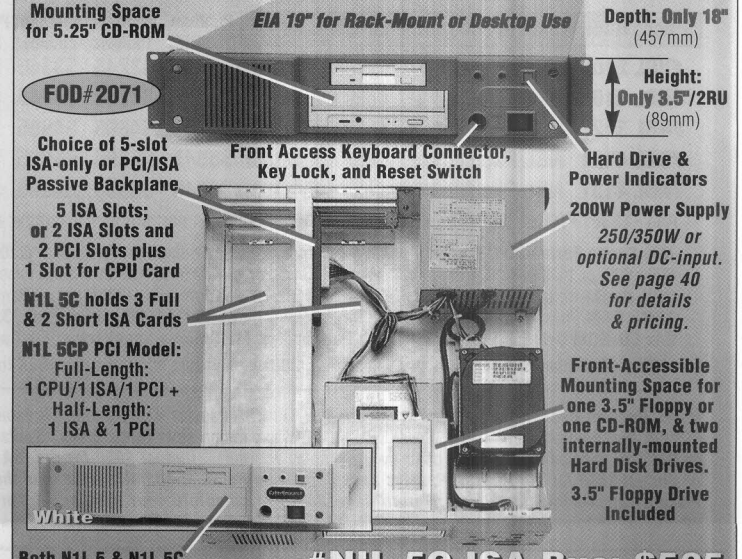


We'll include a 1.6GB 3.5" Hard Drive for only $250 with purchase of a system with CPU.

#NIL 5 ISA-Bus: $495
#NIL 5P PCI-Bus: $565

N1L 5C: 5-Slot 2RU Rack-Mt PC w/CD Bay

FOD#2071

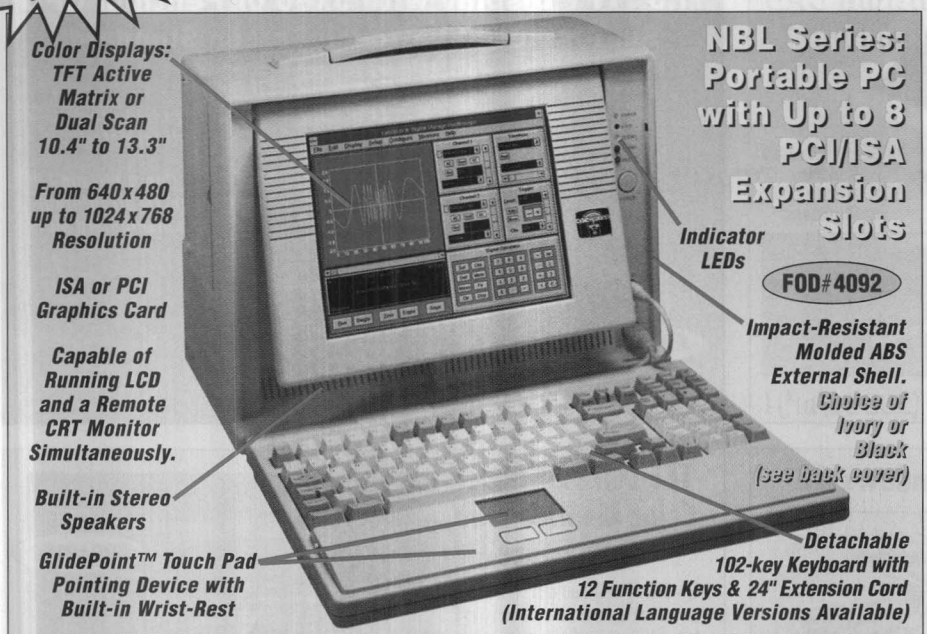


Both N1L 5 & N1L 5C are available in white *(add suffix –WHITE to part#).*

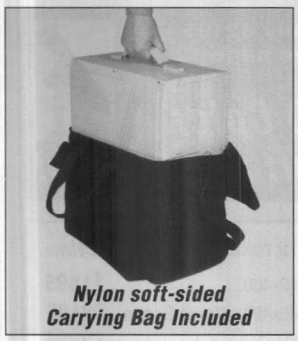
#NIL 5C ISA-Bus: $525
#NIL 5CP PCI-Bus: $595

BE$T VALUE!

Economical NBL Portable PC • 8 PCI/ISA Slots



- 133 to 300MHz Intel Pentium
- 32 to 256MB (PII: 768MB) RAM
- Resolution to 1024 x 768
- 1.44MB Floppy Standard
- 1.6GB IDE Hard Disk Drive
- 24x CD-ROM Standard



Nylon soft-sided Carrying Bag Included

Horizontal-Mt. Side-Accessible 3.5" 1.44MB FDD & 24x CD-ROM

Rugged Metal Chassis with Full-Size ISA & PCI/ISA Slots

- Ultra-High Performance Portable PC
- Up to eight PCI/ISA Expansion Slots
- 13.3" TFT Active Matrix Color • 1024x768
- GlidePoint™ Touch-Pad Pointing Device

A Portable PC with up to 8 Expansion Slots!

The **NBL** series of portable PC systems from CyberResearch offers the power of a Pentium desktop in a compact portable carrying case. The NBL has been designed specifically to meet the needs of engineers and scientists who require a powerful, easy-to-use PC suitable for demanding industrial and mobile applications.

The **NBL** features a choice of five world-class color displays from a 10.4" Dual Scan (640x480) up to a 13.3" Active Matrix TFT (1024x768). CPU options include: the Intel Pentium-133, 166, & 200MHz, 233MHz MMX, or Pentium II-300MHz processors. If you need more room, the **NBL** is the solution with space for up to 8 expansion slots (five full-length & three half-length). NBL Portable PCs are also available with passive backplanes — 4 ISA / 1 CPU / 3 PCI or 8 ISA slots for use with our All-in-One CPU cards. Each Packaged System includes: 32MB RAM, a 1.44MB Floppy, a 1.6GB Hard Drive, and a 24x CD-ROM Drive.

Specifications:

CPU: Pentium-**133, 166, 200;** or **233MHz MMX;** or **300MHz Pent. II**

Expansion Slots: 8 Slots max; 5 full-length & 3 half-length. The NBL PCI/ISA package below provides**:** 3 ISA full-length, 1 PCI/ISA full-length, and 3 PCI half-length slots (note: one PCI slot is required by the display adapter.) *Passive backplane versions optional: 8-Slot ISA or 8-Slot PCI/ISA (4 ISA / 1 CPU / 3 PCI slots).*

Memory: 32MB RAM; 256MB max. (Pent. II: 768MB) & 256KB Cache.

Storage: External Access: one 5.25" & two 3.5" bays. Internal space for one 3.5" device. 3.5" 1.44MB floppy & 1.6GB hard drive included.

Multimedia: 24x CD-ROM & built-in dual stereo speakers included.

Display: Active Matrix TFT Color or Dual Scan LCD Color. Internal LCD Display Resolution 640x480 (16M colors); 800x600 (256K colors); 1024x768 (64K colors). 1MB Video RAM (2MB VRAM optional). LED indicators for power, turbo, and Hard Disk. Built-in contrast & sharpness controls. LCD viewing angle 90° adjustable.

External SVGA Color Monitor Port: Simultaneously drives both internal LCD & external CRT monitor up to 1024x768 at 64K colors.

I/O Ports: Two 9-pin RS-232 serial (COM:) ports and one EPP (Enhanced Parallel Printer) port.

Keyboard: Detachable 102-key keyboard with 12 programmable function keys, 24" extension cord, and GlidePoint pointing device.

Power: 250-Watt AC Power Supply, 110/220VAC switchable. 300W, 400W, and DC supplies available on a Special Order basis. See page 4A for inverter and field battery pack for DC operation.

Environmental: 0 to 45°C Operating, –20 to 65°C Storage Temp., Humidity: 20 to 80% (non-cond.). Temp.-controlled cooling fan.

Enclosure: Heavy-duty plated steel chassis with impact-resistant molded ABS shell. **Choice of Ivory or Black color** *(see back cover for photo).* Built-in handle. Nylon carrying bag included.

Dimensions: 15.7"W x 7.7"D x 11.7"H (398mm x 196mm x 297mm). Weight 21 lbs (9.5kg) empty (without cards).

Ordering Information: ***For details call Fax-on-Demand at 203-483-9966 and request FOD #4092***

NBL PCI/ISA Portable PC w/Special Package Pricing

Prices **Reduced** up to $500 from our last catalog!

		Pentium 133MHz	Pentium 166MHz	Pentium 200MHz	Pent MMX 233MHz	Pent II 300MHz
#NBL 210D	NBL Pkg (10.4" D.S. Color 640x480)	$3195	$3245	$3345	$3645	$4445
#NBL 310T	NBL Pkg (10.4" TFT Color 640x480)	$4195	$4245	$4345	$4645	$5445
#NBL 312T	NBL Pkg (12.1" TFT Color 800x600)	$4845	$4895	$4995	$5295	$6095
#NBL 412T	NBL Pkg (12.1" TFT Color 1024x768)	$5845	$5895	$5995	$6295	$7095
#NBL 413T	NBL Pkg (13.3" TFT Color 1024x768)	$6845	$6895	$6995	$7295	$8095

Add **–133P**, **–166P**, **–200P**, or **–233PMX**, or **–300PII** suffix to part number. Example: **#NBL 412T-200P**

NBL Series Portable PC Special Package includes: Choice of displays: 13.3", 12.1" @ 1024 x 768; 12.1" @ 800 x 600; or 10.4" @ 640 x 480 Active Matrix TFT Color; or 10.4" @ 640 x 480 Dual-Scan Passive Color Display. CPU choice of: Intel Pentium-**133, 166,** or **200MHz;** or Pentium MMX-**233MHz;** or Pentium II-**300MHz**; **32MB RAM**, max. 256MB RAM (768MB on Pentium II); **1.6GB (1600MB) Hard Drive**; 3.5" **Floppy Drive**; **24x CD-ROM Drive**; **Windows 95**; **Touch Pad**; built-in **Multimedia Speakers;** and a **Carrying Bag**.

The NBL's standard color is **Ivory**. To specify a **Black** enclosure add the suffix **–BLK** to part number.

Note: Passive Backplane Versions are available. Our ISA Passive Backplane has 8 expansion slots, and the PCI/ISA Passive Backplane has 3 ISA, 2 CPU, & 3 PCI expansion slots (note: 6 slots available: one slot is used by the CPU card and one slot is used by the display adapter). ***Deduct $650 for the ISA Passive Backplane or Deduct $550 for the PCI/ISA Passive Backplane from Pentium-133MHz price, and then add the Package Price of an All-in-One CPU card from page 36-38 to complete your system.*** To order, add **BP-ISA** or **BP-PCI** suffix to part number (Example: **#NBL 412T-BP-ISA Cost $5195**). PC Accessories start on page 40.

LATE BREAKING NEWS! **Intel Pentium MMX, Pentium PRO, Pentium II Available NOW!! See pages 34-38. Call for Assistance.**

CyberResearch Assistance: Toll-Free 1-800-341-2525 (USA) ☎ **Tel: 203-483-8815 Fax: 203-483-9024**
Applications Engineers: Mon-Fri, 9 AM-5 PM U.S. Eastern Time • **Internet Website:** http://www.cyberresearch.com • **Fax-on-Demand System:** 203-483-9966 • **BBS:** 203-488-8949

$4995! FOD#4045

$4995! FOD#4025

NTH 107: Ultra-Rugged Sub-Notebook PC

NEMA4 with 5x86-133MHz CPU • 7.7" DSTN

Dual Scan Color 7.7" DSTN Display

640 x 480

Touch Screen

High-Impact Molded Case 8.5" x 3.5" x 12"

Weight: 5.5 lbs.

Wireless Ready

Display moves to access Alpha Keyboard if needed

Internal Battery

External Access PCMCIA Slots

From Only: $4995!

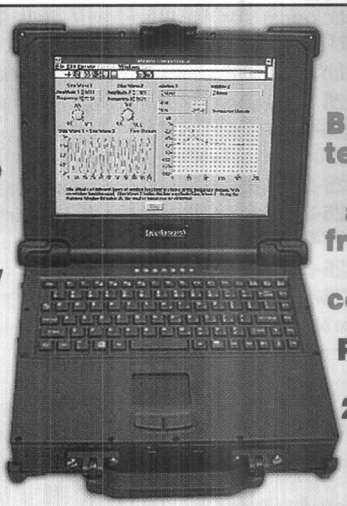
Ideal for Hand-Held Applications

FOD#4053

NBG 311: Ultra-Rugged Notebook PC with Magnesium Case and 2-Slot Docking Station

11.3" TFT Display 800 x 600 180 nits

From Only: $5995!



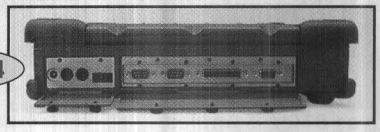
Weight: 10 lbs.

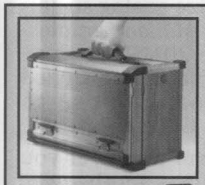
Built and tested to survive a 3-foot free drop onto concrete

Pentium 200 to 266MHz MMX CPU

Shown w/o Docking Station 12.2" x 10" x 2.6"

FOD#4024





NRL 210/212 Rugged Portable with 6 slots for use with CyberResearch CPU Cards

Extruded Aluminum Case

6 Slot ISA/PCI Backplane

MIL-Spec Finish

Full 101-key Keyboard

TFT Display

10.4" 800 x 600 or 12.1" 1024 x 768

From Only: $5995!

Weight: 26 lbs. 17" x 11.2" x 9.1"

FOD#4094

NBM 106: Ultra-Rugged Sub-Notebook PC

NEMA4 with 486DX/4-100MHz CPU • 6.5" TFT

Waterproof Magnesium Case 10"x3"x7"

6.5" Color TFT Display 640 x 480

Weight: 5.2 lbs.

Wireless Ready

Internal Battery

Weather Resistant

External Access PCMCIA Slots

-20 to +60°C

From Only: $5995!

FOD#4055

In single-channel mode, the signal connected to channel A is routed to both A/D converters, with the clocks interlaced to provide 250 million samples per second to on-board memory.

Each card includes GageScope menu-driven software. Driver packages for LabWindows, LabVIEW, MS Windows 3.x, Win95, NT, C, QuickBASIC, & more are available – see pg 6C.

Ordering Information: **Call Fax-on-Demand for more info: FOD# 1515**

#DSO 2125 2-Chan, 250 MHz Digital Scope Bd. w/256K Buffer...**$4995**
#DSO 2125-03 2-Chan, 250 MHz Digital Scope Bd. w/1 MS Buffer...**$5495**
Includes a DSO 2125 board, software, & manual. Special orders up to 8MB Memory Avail.
#DSO 2126-02 External Clock Upgrade to use an external timing source..**$300**
#DSO 2126-03 Master Upgrade to use 2 or more DSOs in 1 PC (max 8)..**$300**
#DSO 2126-04 Slave Upgrade (Multiple DSOs: use 1 Master + Slaves) **$300**
#DSO 2126-06 Gated Digitization Upgrade (adds Gated Digitization)..**$400**
#DSO 2126-08 ETS Upgrade (2GS/s Equivalent Time Sampling, call for info)..**$500**
GageScope MultiScope Software (**DSO 302**) is required to use 2 or more boards in 1 PC.

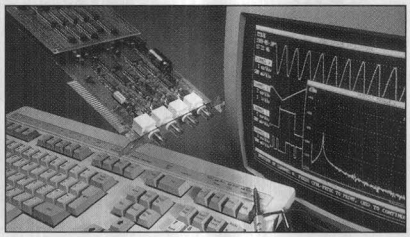
Up to 8 DSO 265s may be used in one PC in a Master/Slave configuration to achieve as many as 16 simultaneous channels working on a common clock and trigger, each at 65 to 130 MHz!

Each DSO 265 digital scope card includes the menu-driven GageScope software package (pg 6C). In addition, driver packages for LabWindows, LabVIEW, Windows 3.x, Win 95, Win NT, C, QuickBASIC, and more are available – see page 6C.

Ordering Information: **Call Fax-on-Demand for more info: FOD# 1565**

#DSO 265 2-Chan, 130 MHz Digital Scope Board w/256K Buffer..**$3495**
#DSO 265-03 2-Chan, 130 MHz Digital Scope Board w/1 M Buffer....**$3895**
#DSO 266-07 External Clock Upgrade to use an external timing source..**$200**
#DSO 266-09 Master Upgrade to use 2 or more DSO 265s in 1 PC.....**$100**
#DSO 266-10 Slave Upgrade (Multiple DSO 265s: use 1 Master + Slaves)...**$100**
#DSO 266-11 Gated Digitization Upgrade (adds Gated Digitization).....**$400**
Special orders up to 8MS buffer. Includes a CompuScope 265 board, software, & manual.
GageScope MultiScope Software (**DSO 302**) is required to use 2 or more boards in one PC.

50 MHz Digital Scope with up to 8 MSample Buffer



DSO 225 Compuscope offers deep buffers of 32 KSamples to as high as 8 MegaSamples.

Each board includes two input channels, an external trigger channel, and a test output channel. Both channels may be sampled simultaneously at up to 25 MHz each. The test output is a 5V TTL pulse at 1 kHz for standard test applications. BNC connectors with AC & DC coupling are provided for all channels.

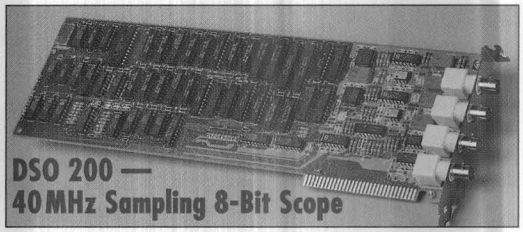
Our **DSO 226-17** (gated digitization) allows the capture of burst-mode signals where the burst has a high-frequency component, but the signal between the bursts is not of interest. This upgrade replaces the test output channel with a pulse input channel. Samples are taken only when the pulse input is high. The software supplied with the board accesses this function.

Drivers for LabVIEW, Win95, NT, 3.11, C, & more available. See pg. 6C or call our Fax-on-Demand for more: **FOD# 1525**.

Ordering Information: (May be special-ordered with up to 8MSamples of Memory Buffer.)

#DSO 225 50 MHz Digital Scope w/32KSample Buffer.....**$1495**
#DSO 225-01 DSO 225 Scope Board w/128KSample Buffer.....**$1995**
#DSO 225-05 DSO 225 Scope Board w/512KSample Buffer **$2795**
#DSO 226-17 Gated Digitization Upgrade (adds Gated Digitization).....**$400**
#DSO 226-18 External Clock Upgrade to use an external timing source..**$200**
#DSO 226-19 Master Upgrade to use 2 or more DSOs in 1 PC (max 16) ..**$100**
#DSO 225-23 Slave Upgrade (Multiple DSO 225s: use 1 Master + Slaves)...**$100**
DSO 225 models include a board, GageScope software, two x10 probes, & a user's manual.

40 MHz Data Acquisition for a Low Price



The **DSO 200 CompuScope Lite** is the world's lowest-cost PC-based data acquisition card which can digitize analog signals at a maximum real time sampling rate of 40 *Million* Samples-Per-Second (MSPS) in single channel mode, and 20 MSPS in dual-channel mode with a bandwidth of 8 MHz. **No other board (or bench-top unit for that matter) comes close to offering this kind of performance for so little money.**

Now you can have a high-speed A/D system wherever you need one. Putting several boards in one system is another way to maximize the benefits of the CompuScope Lite's low price. You can combine 2 CompuScope Lite boards in a Master-Slave configuration to achieve 4 simultaneous channels in one PC.

All of our CompuScopes include GageScope software FREE. Many software driver packages are available – see page 6C. Choose either our 16K scope (16,000-sample buffer), or our CompuScope Lite DSO 210 model with a 64K buffer.

Ordering Information: **Call Fax-on-Demand for more info: FOD# 1510**

#DSO 200 2-Channel, 40 MHz Data Acquisition Bd. w/16K Buffer.....**$595**
#DSO 210 2-Channel, 40 MHz Data Acquisition Bd. w/64K Buffer.....**$995**
#DSO 206-20 Master Upgrade to use 2 CompuScope Lites in 1 PC.....**$100**
#DSO 206-24 Slave Upgrade (2 DSOs in 1 PC: use 1 Master + 1 Slave)....**$100**
DSO 200/210 include a CompuScope Lite board, software, and a manual. *GageScope MultiScope Software* (**DSO 302, $250**) is required to use 2 CompuScope boards in one PC.

CyberResearch Assistance: Toll-Free 1-800-341-2525 (USA) ☎ Tel: 203-483-8815 Fax: 203-483-9024
Applications Engineers: Mon-Fri, 9 AM-5 PM U.S. Eastern Time • **Internet Website:** http://www.cyberresearch.com • **Fax-on-Demand System:** 203-483-9966 • **BBS:** 203-488-8949

CompuScope™ DSO 512, 2012, 6012, & 8012: The World's Fastest 12-Bit Data Acquisition Boards

Our **DSO 12-Bit Models** shatter the old speed limits with sampling rates faster than any other A/D board. Our PCI and ISA-bus **12-bit DSO boards** represent the first affordable method of obtaining full 12-bit A/D resolution at multi-megaHertz speeds.

Ultra Fast, 12-Bit Sampling

These boards digitize analog signals using a 12-bit A/D converter with maximum sampling rates of **5 MHz** to **100 MHz**. There are two monolithic flash A/D converters on each-board. In single-channel mode, the two ADCs are clocked in a "ping-pong" mode to achieve data acquisition rates up to **100 Million Samples/Second.** On-board programmable gain amplifiers and offset control circuits ensure measurement accuracy and long-term thermal stability.

Unparalleled Memory Depth

The **DSO 512, 2012,** & **6012** offer buffer memory of 512K-Samples. They can be special-ordered with 1 **M**ega-**S**ample (MS), 2MS, 4MS, 8MS, or 16MS of buffer memory. The **PCI**-bus and **8012/8012A** DSO models come with 512KS, & can be special-ordered with 1 MS, 2 MS, or 4 MS of buffer memory, allowing you to sample at full speed to on-board memory for up to 4 million samples. Keep in mind that a 1 MS buffer actually has 2MB of RAM, as each sample requires 2 bytes.

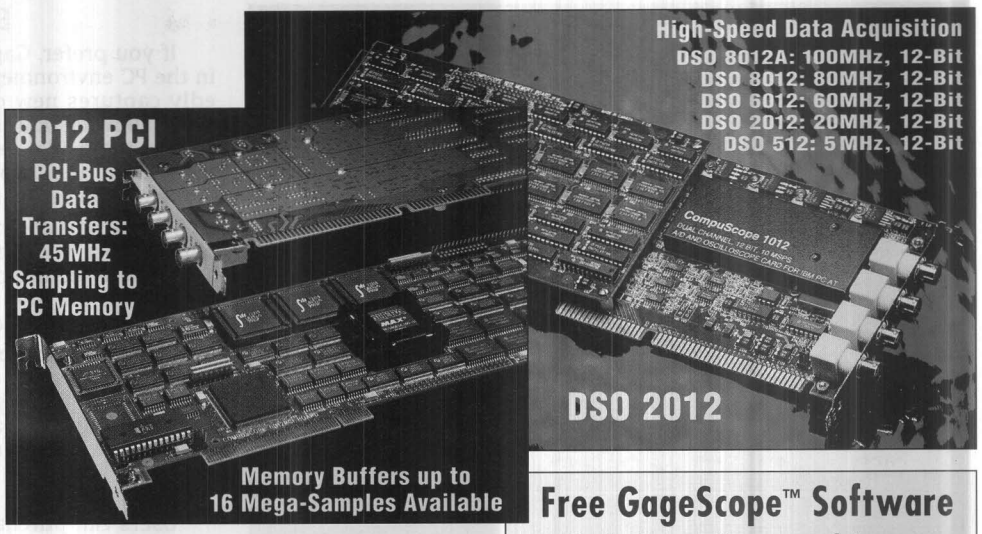
The data stored in on-board memory is mapped into the memory of the your PC. This means that it can be accessed just as easily and quickly as the PC's own memory. According to benchmarks, data throughput to PC memory is in excess of 1.5 MegaWords (samples) per second on a '486 machine, *and up to 45 Million SPS for the PCI models.*

Multi-Card Systems

A Multi-Card system, comprised of one Master and up to 7 Slave boards (ISA), can be ordered from the factory. This lets you capture up to 16 channels simultaneously with a common clock and trigger. A board-to-board cable is supplied with multi-board systems. This cable carries all the signals needed for proper synchronization.

Outstanding Features

- **16-Bit ISA Bus** can transfer a 12-bit sample in one memory cycle.
- **Interrupt Capability** is switch-selectable.
- **Individually-Shielded Analog Inputs** provide extra shielding required by both DSO cards due to the enhanced dynamic range. The shielded section contains the PGAs which control input amplification of the two channels. In addition to the shielding, the six-layer printed circuit board protects sensitive analog signals with three power planes.
- **Flexible Triggering** features state-of-the-art windowed triggering. Two independent comparators provide triggering from one or both channels, from an external signal, or from a logical combination, all at 2 independent trigger levels. In the case of a multi-card system, it is possible to have up to 16 trigger sources.
- **External Clock** option can be ordered from the factory in situations where a special sampling frequency is desired.
- **Gated Digitization** option stores data to RAM only when the external TTL GATE input is HIGH. This is useful when you need to stack successive data captures in the on-board memory.



PCI: Fastest Data Transfers of ANY Board

Real-time data acquisition is limited by the ability of a board to collect and transfer the data to your PC. Many high-speed A/D boards store data to on-board memory, until a data transfer can be executed. This generally limits high-speed sample sizes to the size of the board's expensive on-board buffer memory.

Our DSO PCI data acquisition boards offer a new level of high performance, while turning your PC's memory into a high-speed data buffer. They take advantage of the data transfer rate offered by PCI-bus technology to achieve ultra-high data acquisition rates.

Free GageScope™ Software

Each CompuScope card is accompanied by a free copy of the powerful **GageScope** software package, which allows the board to be used as a PC-based digital oscilloscope. See pp. 6C.

Capture 45 mega-samples/sec., continuously! This makes it possible to take samples of great size, limited only by the amount of relatively inexpensive PC memory in your computer. For example, you can acquire a full second of data at 45 million samples/sec, into 90 MegaBytes of RAM (each sample requires 2 bytes), **with no gaps in your data.**

What is a DSO PCI Board?

DSO PCI models consist of two boards installed in the PC, connected together via a ribbon cable. The Analog Board, installed in an ISA slot, has all the specifications of the ISA version. The PCI Memory Board plugs into the PCI bus and is connected to the Analog Board via a ribbon cable.

Available with memory depths of 512K to 4 Million 12-bit samples, the memory buffer may be easily used as a circular buffer for storage of pre- and post-trigger data.

Ordering Information: **Detailed information available via Fax-on-Demand: 203-483-9966 FOD#**

#DSO 512	5 MHz, 12-Bit ISA CompuScope w/512 KSample Buffer & GageScope Softw...	**$2795**	**1555**
#DSO 512P	5 MHz, 12-Bit PCI-bus Card Set w/512 KSample Buffer & GageScope Softw...	**$4795**	**1557**
#DSO 2012	20 MHz, 12-Bit ISA CompuScope w/512 KSample Buffer & GageScope.....	**$4995**	**1511**
#DSO 2012P	20 MHz, 12-Bit PCI-bus Card Set w/512 KSample Buffer & GageScope.....	**$6995**	**1522**
#DSO 6012	60 MHz, 12-Bit ISA-bus Card Set w/512 KSample Buffer & GageScope.....	**$6995**	**1512**
#DSO 6012P	60 MHz, 12-Bit PCI-bus Card Set w/512 KSample Buffer & GageScope.....	**$8995**	**1562**
#DSO 8012	80 MHz, 12-Bit ISA CompuScope w/512 KSample Buffer & GageScope.....	**$7495**	**1580**
#DSO 8012P	80 MHz, 12-Bit PCI-bus Card Set w/512 KS Buffer (1 MS max) & GageScope...	**$9495**	**1582**
#DSO 8012A	100 MHz, 12-Bit ISA CompuScope w/512 KSample Buffer & GageScope...	**$7995**	**1580**
#DSO 8012AP	100 MHz, 12-Bit PCI CompuScope w/512 KSample Buffer & GageScope...	**$9995**	**1582**

GageScope menu-driven software and two x1/x10 Oscilloscope Probes are included with each board.

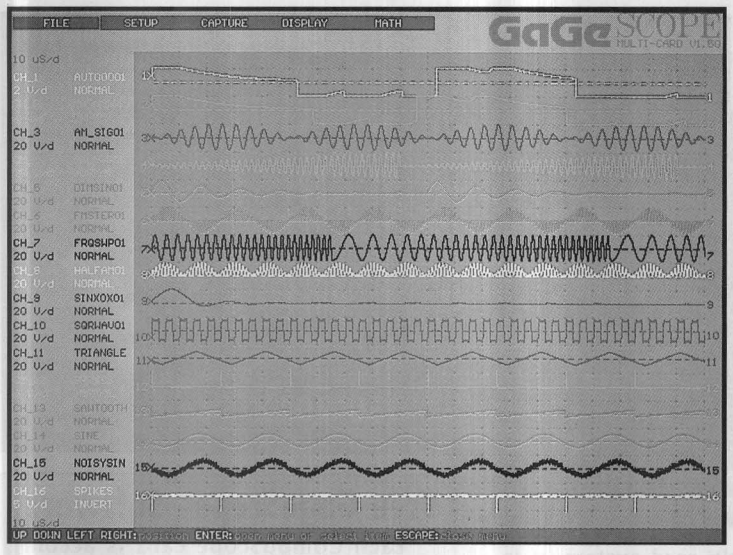
Call for upgrades to multiple-card systems, gated digitization, external clock input, and other options.

PCI models available with up to 4-MegaSample buffers; ISA models up to 16MS memory (4MS on 8012/8012A).

Memory buffer sizes not shown may be special-ordered – Call or fax for more information.

For a list of DSO Fax-on-Demand documents, ask for FOD#1501

Use GageScope™ Full-Color Oscilloscope Software or High-Performance Drivers for Custom Programming



Using our PC-based digital oscilloscopes has now been made easier than ever. The **GageScope** software package is included *at no charge* with each DSO model. A powerful software package for controlling up to 16 DSO-series oscilloscopes of the same type, GageScope makes using our DSO hardware extremely simple.

Powerful and easy to use, GageScope allows the user real-time sampling rates up to the full speed of your DSO board(s) and memory depths up to 8 million samples on as many as 32 channels. (Other scopes often only allow two channels, 4K samples max.)

GageScope allows users to load and store a literally infinite number of signals and setups, print the screen for record-keeping, and use mathematical functions such as FFT, X-Y, & averaging to analyze data.

The auto-detect feature of GageScope distinguishes it from other oscilloscope and data acquisition software packages which have to be interfaced to the acquisition card or oscilloscope using DOS drivers. GageScope auto-detects any DSO cards present in the system, thus alleviating the most cumbersome activity in a DAS experiment.

In addition, GageScope is superior to other oscilloscope packages in that it can display data with a timebase ranging from 1 nanosecond up to 1 Mega-second. This is made possible by the large memory depths and high sample rates of our DSO cards.

The Auto-Save feature, in conjunction with the Inter-Sample Delay setting allows GageScope to be used in applications not usually related to oscilloscopes. Tasks such as Material Stress Analysis, Fault Monitoring, and Equipment Health Monitoring can be accomplished without having to write a single line of code.

Features

- Auto-detection of memory size & hardware configuration
- Timebase from nanoseconds to 1 Megasecond (10^{-8} seconds to 12 days)
- Automatic data logging with programmable inter-sample delay
- Auto-save to hard disk
- High speed full-color VGA display mode for viewing your data
- Cursor adjustments and ZOOM
- Advanced Signal Averaging module available
- Support for Fast Fourier Transforms of up to 1024 data points
- Enhanced Math Functions
- Source code for software drivers included with each package
- OEM support for systems integrators
- Strong Technical Support

Emulate a Traditional Scope

If you prefer, GageScope can simulate a traditional oscilloscope in the PC environment. In the Continuous Mode, GageScope repeatedly captures new data and re-draws the signals on your screen, while allowing you to change capture & display parameters without leaving the mode. Features such as Timebase, Vertical Scale, Sample Rate, Coupling, Input Voltage Range, Trigger Source, Level, and Slope can be set using hotkeys while in the Continuous Mode.

Algorithms for high-speed screen update greatly enhance the performance of GageScope, and instantaneous screen updates show a complete picture of the test in progress. Cursors can be used to make absolute and differential measurements on the screen and Zoom can be used to pinpoint the problem areas in the signal.

The mainstay of GageScope software is its ability to draw the captured data on the screen at a very high speed: 65,536 points can be displayed in one second. Proprietary display routines, drawing algorithms, and memory caching schemes allow GageScope's TriggerView function to update the screen over 40 times/second.

Up to 32 Synchronized Inputs

Users can purchase GageScope Multi-Card Software (#DSO 302) to use up to 16 CompuScope Cards in a single system to achieve 32 simultaneous channels working on a common clock and trigger.

Highly useful built-in Math Functions allow the user to specify any channel to display the result of an algebraic addition, subtraction, or multiplication. All of the mathematical operations may be easily performed on live or previously-captured data. GageScope has **FFT, X-Y,** and **Averaging** modules available.

Software Driver Packages

Our software driver packages consist of subroutines which allow the programmer to initialize the hardware, set up all the relevant parameters, start an acquisition, and transfer data from on-board memory to the PC's memory or extended memory. **Full support is available for DOS, Windows 3.x, Windows 95, & Windows NT.** For Windows users, our DSO cards can be programmed in any language which can make calls to a Windows DLL (NT, 95, or 3.x). Sample programs are provided in Visual Basic, Visual C++, & Borland C++ (plus Borland Pascal/Win 3.1). The DLL can be modified by the application programmer to customize it to your specific needs.

ISA card DOS drivers are available for Microsoft C 5.1+, Turbo C 2.0+, Watcom C 9.0+, and QuickBASIC (project files are for Borland C 3.1). PCI DOS drivers available for Watcom C & Borland C. Source Code is provided for the C drivers, simplifying advanced programming projects.

Drivers are available for **LabVIEW®** & **LabWindows®** software. The LabVIEW drivers include a number of VI's which allow the user to access all the hardware features of the DSO cards *without writing a single line of code.* The LabWindows driver comes with a sample program in C and another in BASIC. The C source code is included and is compatible with Microsoft C 5.1. **Fax-on-Demand info: FOD#1530.**

Ordering Information: LabVIEW® & LabWindows® are registered trademarks of National Instruments.

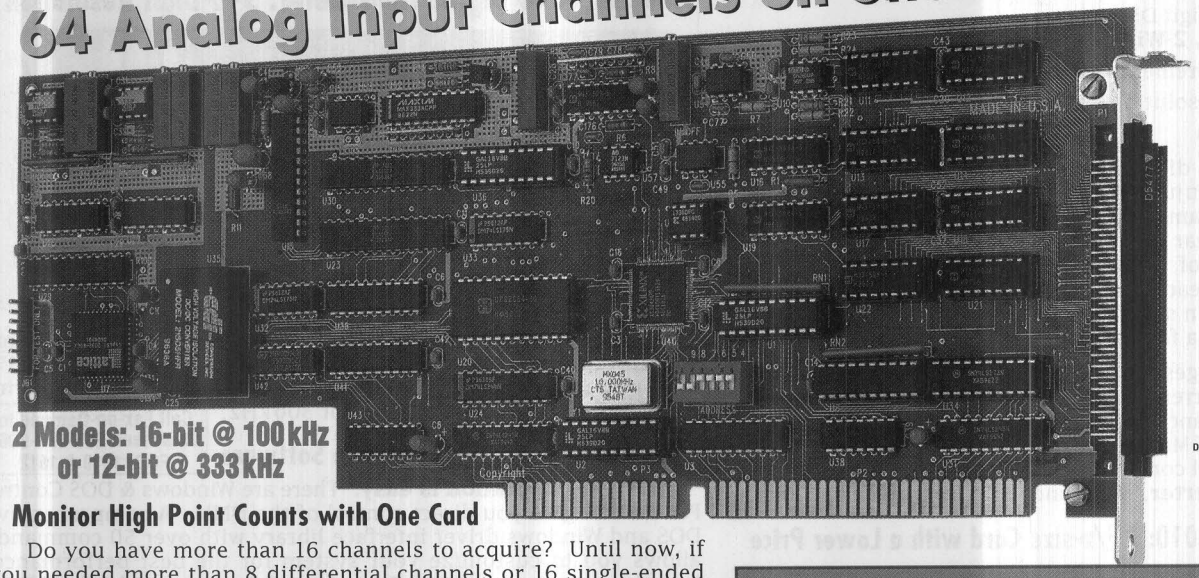
#DSO 301	GageScope Software for DSO-series (Single scope)	**$FREE!**
#DSO 302	GageScope Software for DSO-series (Multiple scopes)	**$250**
#DSO 303	GageScope optional FFT-Processing Software Module	**$100**
#DSO 304	GageScope optional Signal Averaging Software Module	**$100**
#DSO 305	GageScope optional X-Y Software Module	**$100**
#DSO 201-xx	DOS Software Driver Pkg. (Specify: **01**=C, **02**=QuickBasic)	**$250**
#DSO 201-xx	DLL Pkg for Windows (Specify: **05**=3.x, **08**=95, **09**=NT)	**$250**
#DSO 201-xx	LabVIEW Drivers: (Specify: **06**=Win 3.x, **10**=95, **11**=NT)	**$250**
#DSO 201-xx	LabWindows CVI: (Specify: **07**=Win 3.x, **12**=95, **13**=NT)	**$250**
#DSO 201-14	Software Driver Package for QNX (in Watcom C 10.6)	**$250**
#DSO 201-16	Software Driver Package for HP VEE	**$250**
#DSO 201-17	Traditional DSO Replacement Software Driver	**$250**

If you are ordering driver software for **PCI-bus** boards, replace the **201** with **601**.

CyberResearch Assistance: Toll-Free 1-800-341-2525 (USA) Tel: 203-483-8815 Fax: 203-483-9024
Applications Engineers: Mon-Fri, 9 AM-5 PM U.S. Eastern Time • **Internet Website:** http://www.cyberresearch.com • **Fax-on-Demand System:** 203-483-9966 • **BBS:** 203-488-8949

The 64-Channel A/D Solution: CYDAS 6400

64 Analog Input Channels on one Board



2 Models: 16-bit @ 100kHz or 12-bit @ 333kHz

CYDAS 6400

Low-Level Ground	1	51	Low-Level Ground
A/D Input 0+	2	52	A/D Input 16+
A/D In 0– / In 32	3	53	A/D In 16– / In 48
A/D Input 1+	4	54	A/D Input 17+
A/D In 1– / In 33	5	55	A/D In 17– / In 49
A/D Input 2+	6	56	A/D Input 18+
A/D In 2– / In 34	7	57	A/D In 18– / In 50
A/D Input 3+	8	58	A/D Input 19+
A/D In 3– / In 35	9	59	A/D In 19– / In 51
A/D Input 4+	10	60	A/D Input 20+
A/D In 4– / In 36	11	61	A/D In 20– / In 52
A/D Input 5+	12	62	A/D Input 21+
A/D In 5– / In 37	13	63	A/D In 21– / In 53
A/D Input 6+	14	64	A/D Input 22+
A/D In 6– / In 38	15	65	A/D In 22– / In 54
A/D Input 7+	16	66	A/D Input 23+
A/D In 7– / In 39	17	67	A/D In 23– / In 55
Low-Level Ground	18	68	Low-Level Ground
A/D Input 8+	19	69	A/D Input 24+
A/D In 8– / In 40	20	70	A/D In 24– / In 56
A/D Input 9+	21	71	A/D Input 25+
A/D In 9– / In 41	22	72	A/D In 25– / In 57
A/D Input 10+	23	73	A/D Input 26+
A/D In 10– / In 42	24	74	A/D In 26– / In 58
A/D Input 11+	25	75	A/D Input 27+
A/D In 11– / In 43	26	76	A/D In 27– / In 59
A/D Input 12+	27	77	A/D Input 28+
A/D In 12– / In 44	28	78	A/D In 28– / In 60
A/D Input 13+	29	79	A/D Input 29+
A/D In 13– / In 45	30	80	A/D In 29– / In 61
A/D Input 14+	31	81	A/D Input 30+
A/D In 14– / In 46	32	82	A/D In 30– / In 62
A/D Input 15+	33	83	A/D Input 31+
A/D In 15– / In 47	34	84	A/D In 31– / In 63
Ground for DAC 0	35	85	DOut 0
DAC 0 Output	36	86	DOut 1 (Digital Outputs)
Ground for DAC 1	37	87	DOut 2 (Digital Outputs)
DAC 1 Output	38	88	DOut 3 (Digital Outputs)
Counter 0 In/Clock	39	89	Chassis Ground
DIn 2/Ctr 0 Gate	40	90	+12V (From PC Bus)
Counter 0 Out	41	91	Chassis Ground
DIn 0/AD Pacer In	42	92	–12V (From PC Bus)
DIn 1/AD Gate/AD Trig	43	93	DIn 6
Digital Inputs — DIn 3	44	94	DIn 7
Digital Inputs — DIn 4	45	95	DOut 4
Digital Inputs — DIn 5	46	96	DOut 5 (Digital Outputs)
–5 V_{REF} Out	47	97	DOut 6 (Digital Outputs)
+5V (From PC Bus)	48	98	DOut 7 (Digital Outputs)
SSH Out	49	99	External Interrupt In
Chassis Ground	50	100	Chassis Ground

Monitor High Point Counts with One Card

Do you have more than 16 channels to acquire? Until now, if you needed more than 8 differential channels or 16 single-ended A/D channels, you had to use one or more external multiplexing panels and/or multiple data acquisition (A/D) cards in your system. Our new CyDAS 6400 boards provide 64 single-ended analog input channels (up to 32 differential inputs), *four times that of most other data acquisition boards.*

The **CyDAS 6400** is available in a high-speed 333kHz 12-bit model and a surprisingly fast 100kHz 16-bit board. Both models include 2 analog outputs, 8 digital inputs, and 8 digital outputs. The analog outputs (D/As) feature the same resolution as the A/D channels – i.e. the 16-bit CyDAS 6402HR has 16-bit analog outputs. Advanced features include:

- 1024-sample FIFO buffer for Windows Programming
- Programmable input ranges and unipolar/bipolar ranges
- Software-configurable for Edge or Level-activated triggering; programmable for polarity (Rising/Falling Edge trigger)
- Full support for pre- and post-trigger acquisition
- D/A outputs may be updated independently or simultaneously
- Optional terminal panel and cable help keep wiring simple
- Supported by HP VEE software & the Universal Driver Library

Compatible Mode vs. Enhanced Mode

The **CyDAS 6400** may be used in two different modes: either in Enhanced Mode or Compatible Mode. Enhanced Mode provides access to all 64 single-ended A/D channels (or up to 32 differential A/D channels). Compatible Mode allows you to use existing DAS-16 compatible software, but only provides access to only 16 channels.

Software Support & Accessories

The Universal Driver Library (CyDAS UDR, page 60) provides software drivers for various programming languages. A LabVIEW® extension of the Universal Library is available for $49 (CyDAS ULV). The **STA 100** screw terminal panel and **CBL 10002** (required) provide access to all of the 100 signals on the board's connector.

SPECIFICATIONS:

- **Analog Input** Number of Channels: 64 single-ended or 32 differential (16 s.e. or 8 diff. in Compatible Mode)
  Resolution: 12 bits or 16 bits
  Acquisition Speed: 333kHz *(100kHz for 16-bit models)*
  Input Ranges: 0 to 10V, 0 to 5V, 0 to 2.5V, 0 to 1.25V, ±10V, ±5V, ±2.5V, ±1.25V
  FIFO Buffer: 1024 samples
  Integral Linearity: ±2LSB, max
- **Analog Output** – 2 Voltage Outputs: 12-bit Resolution *(16-bit for HR)*
  Typical Update Rate: 200kHz *(50kHz min. for HR model)*
  Analog Output Ranges: ±2.5, 5, 10V; 0 to 2.5, 5, 10V
- **Digital I/O** – 8 Inputs: Input Low: V_{IL} = 0.8V max, –0.5V min
  Input High: V_{IH} = 2.0V min, 7V absolute max
  8 Outputs: Output Low: V_{IL} = 0.4V max; I_{IL} = 8mA min
  Output High: V_{IH} = 2.7V max; I_{IH} = –0.4mA min
  Output Current Sink: 8mA
- **Counter/Timers** No. of Counters: 3 down counters, 16 bits each
  Clock Input Frequency: 10MHz max.
- **Trigger Modes** Trigger Sources: Ext. Hardware or Softw. (compatible mode) Ext. Trigger/Gate, Edge/Level, Polarity/Edge Programmable (enhanced mode)
- **General** Progr. Interrupt Levels: 2, 3, 5, 7, 10, 11, 13
  Operating Environment: 0°C to 70°C (32°F to 158°F)
  Storage Temperature: –40°C to 100°C (–40°F to 212°F)
  Humidity: 0 to 90% non-condensing
  Input Overvoltage: ±15V continuous
  Power Requirements: 1.05A typ. *(1.17A for 16-bit)*; 1.67A max.

Ordering Information: **Call our Fax-on-Demand System for more information: 203-483-9966 FOD#3064**

#CYDAS 6402	333kHz 12-Bit **64-Channel** Data Acquisition Board with 8 Digital I/O Lines and Two 12-Bit Analog Outputs	$799
#CYDAS 6402HR	100kHz 16-Bit **64-Channel** Data Acquisition Board with 8 Digital I/O Lines and Two 16-Bit Analog Outputs	$999
#CBL 10002	2-foot 100-pin Cable: CyDAS 6400 High-Density 100-pin Connector to Two 50-pin Header Connectors	$49
#STA 100	100-Pin Screw Terminal Panel (see page 64 for photo)	$149
#CYDAS UDR	Universal Driver Library Software (see page 60)	$49
#CYDAS ULV	LabVIEW Extension to the Universal Driver Library (requires CyDAS UDR – see page 60)	$49

Each **CyDAS 6402/6402HR** card comes with a detailed user's manual. Please call for the latest list of 3rd-party software packages supporting this product.

SM 2010 & 2020 PC Plug-In Digital Multimeters

"What Makes the SM 2020 Better than the Rest?"

- Full-Featured 5½-digit DMM:
  VDC, VAC, IDC, IAC, 2-Wire Ω, 4-Wire Ω, Frequency
- True RMS AC Measurements, 10Hz to 100kHz bandwidth
- ±300,000-Count Resolution
- 1 to 200 readings per sec.
- Over 300V isolation
- Optional Frequency Counter

The **SM 2020** 5½-digit DMM uses a state-of-the-art 20-bit integrating ADC in conjunction with digital signal processing. Reading rates are programmable to exactly match your application. For precise, highly linear measurements (typically better than 10 ppm), and over 80 dB of noise rejection, the SM 2020 can be set to the high resolution reading rate. When digitizing low frequency activity, (for example, in seismic studies,) the VDC input function can be programmed to a fast 200 readings per second.

There are 4 VDC ranges, 300mV to 300V, with 1 uV resolution on the lowest range; & 3 current ranges from 3mA to 300mA. DC ranges have 10MΩ input resistance for 300V/30V, with >1000MΩ for lower ranges; AC inputs are 1MΩ. Convenient and fast auto-ranging is provided by the internal controller. **AC measurements are made with a true RMS converter**, with bandwidth from 10Hz to 100kHz.

New 4½-Digit SM 2010: A ½-size Card with a Lower Price

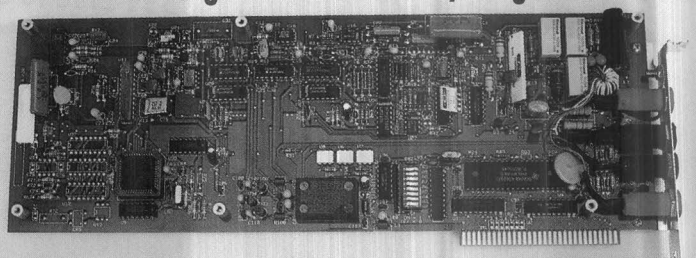
The new **SM 2010 & 2010CT** are smaller, simpler versions of our **SM 2020** models on a half-length PC card. Ranges include 250mV to 250V (20Hz to 100kHz); 250Ω to 25MΩ; 2.5/25/250mA & 2.5A ranges (more than the 2020!). The **2010CT** adds frequency measurement as well: 5Hz to 100kHz, best resolution is 1.0mHz.

Frequency & Period Measurement

The **SM 2020CT** is an enhanced version of the **SM 2020** card with all of the same functions & specifications, plus these features:

- Frequency Measurement
- Period Measurement
- External Hardware Triggering
- Programmable Level Triggering
- High-Speed 64-Sample Memory Buffer: **acquire up to 1000 samples/sec!**

The SM 2020 Digital Multimeter: 5½-Digit Resolution



Perfect for Documentable Measurements in ATE Systems

Frequency and Period measurements can be made in AC Voltage and Current with 5 digits of resolution. Superb accuracy of 0.01%. Resolution of 1 milliHertz is provided from 2Hz to 100Hz, with an overall measuring bandwidth of 300kHz.

Call Fax-on-Demand for Datasheet: 203-483-9966 FOD#1610 & 1612

Easy-to-use Software

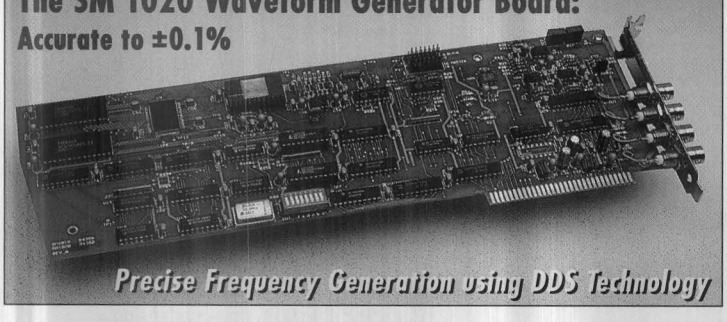
System Integration is easy. There are Windows & DOS Control Panels that give you direct control of the DMM. A comprehensive DOS and Windows driver interface library with over 50 commands allows you to customize your system for the best performance. Includes support for Visual Basic, Visual C++, (& QuickC for 2020), and Windows 3.x/Win95 (both DLL & OCX with source code). The Windows DLL can be used to integrate your **SM 2010** or **SM 2020** into any of several software environments, such as LabWindows™, ATEasy™, or LabVIEW®. Windows NT drivers are available for $195.

Ordering Information: Each SM pkg. includes: Board, Software, & a User's Manual.

#SM 2020	5½-Digit Digital Multimeter (DMM) Card	**$895**
#SM 2020CT	5½-Digit DMM + Counter/Timer, Analog Trigger, & High-Speed Buffer	**$995**
#SM 2010	4½-Digit Digital Multimeter (DMM) Card	**$695**
#SM 2010CT	Enhanced 4½-Digit DMM Card w/Counter/Timer Only	**$795**

Affordable Arbitrary Function and Pulse Generators

The SM 1020 Waveform Generator Board:
Accurate to ±0.1%



Precise Frequency Generation using DDS Technology

The **SM 1000** series is a family of PC-based function, arbitrary waveform (ARB), and pulse generator boards that exploit **Direct Digital Synthesis** (DDS) technology to produce signals of superior quality. The **SM 1010/1020/1030** function generators have been designed as complete units, with full triggering and gating, stored waveform, and ARB capabilities. These generators produce low-noise, low-distortion sine waves, settable with constant 0.01Hz resolution from DC to 300kHz (3MHz with the SM 1030).

The **SM 1020** also contains a triggerable pulse generator that outputs precisely calibrated pulse widths from 100 nanoseconds to 100 seconds. This pulse generator is available separately as model **#SM 1005**, useful as a stand-alone pulse generator, or as a delay, trigger, or gating generator in conjunction with an SM 1010/1020/1030 board.

Waveform & Function Generator

In addition to creating arbitrary waveforms, an included library of commonly used waveforms makes these boards useful as function generators as well. Standard waveforms supplied are:

- sine
- sine (x)/x
- square wave
- noise
- haversine
- havertriangle
- trapezoid
- exponential
- triangle
- positive & negative ramps

Coordinate Two or More Boards

Two or more plug-in cards can be used in combination to perform complex operations. Cards can be interconnected via an auxiliary connector in order to share clock signals, triggers, and outputs, using a ribbon cable, part #SM 10CBL. Simultaneous outputs from a pair of SM 1020/1030s can be summed, modulated or phase shifted. Outputs can be synchronized to perform more advanced functions such as generation of 2-tone signals, amplitude modulation, FSK, trigger-delay, and generation of quadrature signals.

Easy to use Windows and DOS 'setup' programs and interactive control panels are included with each SM 1000 series board, so you can be up-and-running in minutes. Full support is included for Windows 95; drivers to use Windows NT are available for $195.

Ordering Information: **Call Fax-on-Demand for more information: 203-483-9966 FOD#1620**

#SM 1005	Pulse Generator	**$585**
#SM 1010	Arbitrary Waveform & Function Generator, 8-Bit Resolution, 300kHz Bandwidth	**$685**
#SM 1020	Arbitrary Waveform & Function Generator, 12-Bit Resolution, 300kHz Bandwidth	**$895**
#SM 1030	Arbitrary Waveform & Function Generator, 12-Bit Resolution, 3MHz Bandwidth	**$1195**
#SM 10CBL	Master/Slave Cable for Auxiliary Connector	**$12**

CyberResearch Assistance: Toll-Free 1-800-341-2525 (USA) Tel: 203-483-8815 Fax: 203-483-9024
Applications Engineers: Mon-Fri, 9AM-5PM U.S. Eastern Time • **Internet Website:** http://www.cyberresearch.com • **Fax-on-Demand System:** 203-483-9966 • **BBS:** 203-488-8949

- Signal conditioning
- 16-bit integrating A/D conversion
- Serial (RS-485) communications

Industrial Ruggedness

- **500V isolation**
- 14 to 185˚F (–10 to 70˚C)
- Remote configuration and calibration
- Powered by any unregulated power source from +10 to +30VDC

ADAM network (256 modules per serial port, max). Baud rates are selectable up to 19.2k, and RS-485 repeater modules let you extend your network indefinitely, 4000 feet (almost a mile) at a time. Each module is opto-isolated to prevent ground loop problems.

Comprehensive Software

You can use virtually any high level language to output ASCII string functions to your **ADAM** module. Programming involves nothing more than a Command-Response sequence of reading & writing data strings. Included menu-driven utility software greatly simplifies configuration and calibration.

Genie software for Windows is specifically designed for operation with **ADAM** modules. ADAM is supported by most popular data acquisition software programs including Labtech NOTEBOOK. Drivers for LabVIEW & Genesis available. Call about DDE Server S/W.

Ordering Information: **Call Fax-on-Demand for full info: FOD#4211**

#ADAM 4011	Analog Input Module (Thermocouple, mV, V, mA)	**$220**
#ADAM 4012	Analog Input Module (0-10V, 0-20mA, 4-20mA)	**$220**
#ADAM 4013	Analog Input Module (Pt or Ni, 2/3/4-wire RTDs)	**$220**
#ADAM 4014D	Version of 4012 w/4½-Digit LED Readout (V, mV, mA)	**$280**
#ADAM 4017	8-Channel Analog Input Module (6 Diff, 2SE; V, mA)	**$280**
#ADAM 4018	8-Ch. Thermocouple Input Module (6 Diff, 2SE; TC, V, mA)	**$300**
#ADAM 4018M	4018 w/Automatic Data Logging (10,000-sample memory)	**$395**
#ADAM 4021	Analog Output Module (V, mA)	**$220**
#ADAM 4050	Digital I/O Module (7 Inputs, 8 Outputs)	**$160**
#ADAM 4052	Isolated Digital Input Mod. (6 Fully-Isolated+2 w/com. gnd.)	**$160**
#ADAM 4060	Relay Output Module (2 SPDT & 2 SPST Relays)	**$160**
#ADAM 4080D	Counter/Freq. Input Module w/5-Digit LED Readout	**$280**
#ADAM 4510	RS-485 Repeater Module	**$120**
#ADAM 4520	Isolated RS-232 to RS-485 Converter Module	**$120**
#ADAM 4950E	IP66 Sealed Industrial Enclosure (Holds 1 to 6 Modules)	**$120**
#ADAM 243	Power Supply, Surface or Panel-Mount (85-132/170-264VAC)	**$120**
#ADAM xxx	ADAM **DLL** or **VBX** Driver with Manuals (specify w/order)	**$40**
#ADAM LV	ADAM **LabVIEW**® 3.x (16-bit) Driver w/Manual	**$195**

Analog Input Modules

Sample Rate:	10 Hz
Bandwidth:	4 Hz (13.1Hz for 8-Ch. Models)
Accuracy:	> ±0.05%
Zero Drift:	±0.03µV/°C
Span Drift:	±25ppm/°C
Isolation:	500VDC
CMRR (60Hz):	150dB
NMRR (60Hz):	100dB
Digital Outputs:	2 *(4011, 12, 14)*
Output Current:	0-30mA Sink
Digital Inputs:	1 *(4011, 12, 14)*
Event Counter:	50 Hz
Pulse Width:	0.5mSec
Power Consmp:	1.2W (1.8Watts for 14D & 18M)

Analog Input Types

Thermocouples: *(ADAM 4011, 18)*

J	0 to 760°C	**K**	0 to 1000°C
T	-100 to +400°C	**E**	0 to 1400°C
R	+500 to 1750°C	**S,B**	+500 to 1800°C

Volts:

ADAM 4011/18	*ADAM 4012*
±15mV	±150mV
±50mV	±500mV
±100mV	±1V
±500mV	±5V
±1V, ±2.5V	±10V

Current: ±20 mA *(4011/4012/4018)*

Analog Outputs: *(ADAM 4021)*

0 to 10V 0 to 20mA 4 to 20mA

Progr. Output Slope: 0.125 to 128mA/sec. 0.0625 to 64.0V/sec.

RTDs: *(ADAM 4013)*

Pt	α = .00385	α = .003916
Ni	-80 to +100°C	0 to +100°C

Digital I/O Types

Digital Inputs: *(ADAM 4050)*

Number: 7 Channels
Logic Level 0: 0 to +1V max
Logic Level 1: +3.5 to +30V

Digital Outputs:

Number: 8 Channels
Type: Open collector to 30V
Sink current: 30mA

Relay Outputs: *(ADAM 4060)*

Number: 4 Channels (relays)
Type: 2 Form A SPST, 2 Form C SPDT
Breakdown: 500 VAC (50/60 Hz)
Typical On/Off Time: 3msec / 1msec
Total Switch Time: 10 millisec
Contact Ratings:
AC: 125V @ 0.6A; 250V @ 0.3A
DC: 30V @ 2A; 110V @ 0.6A

Editor in which your control strategy is created by simply moving and connecting icon blocks. Each block represents a function such as an analog input, analog output, etc. Just arrange the blocks in the order you want them executed.

A *Display Editor* helps you easily design real-time displays such as instrument panels. **Without doing any programming,** you can create color graphic screens with interactive elements such as push-buttons and slide bars.

Outstanding features include:

- Real-time data acquisition, display, and logging to disk
- Windows DLL-based driver with DDE (Dynamic Data Exchange)
- Closed-loop (PID) process control
- Real-time analysis functions

#PCL GENIE Genie 3.0 for Windows.....**$695**

Special Package Pricing

Combine **Genie** software with the ADAM system and you have a powerful, yet easy-to-use data acquisition system. Choose from 2 ADAM combination packages which pull together all the most popular items at significant savings.

ADAM 400CP includes all the modules needed for analog input, I/O control and PC communications:

- ADAM 4011 Analog Input Module
- ADAM 4060 Relay Output Module
- ADAM 4520 RS-232/RS-485 Converter
- ADAM 243 Switching Power Supply
- RS-232 Cable (DB-9 to ADAM 4520)
- Utility Software, DOS drivers, & manual

ADAM 400CPG simplifies your job by adding easy-to-use *Genie* software:

- Everything included in the ADAM 400CP, described above, plus
- PCL GENIE Genie Software for Windows

Special Package Pricing Offers

#ADAM 400CP Complete H/W Package..**$595**

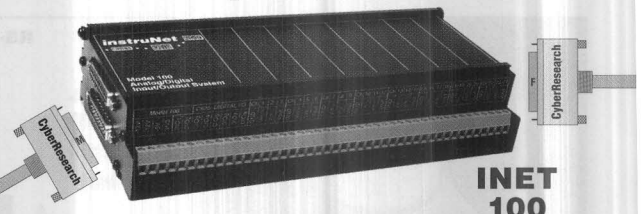
#ADAM 400CPG Complete Package of ADAM Hardware w/Genie 3.0 Software...**$1095**

Precision Direct-to-Sensor Data Acquisition

NEW PRODUCT

FOD#4203

INET 100B



INET 100

Building An instruNet System:

You will need an **INET 200**-series controller card in your PC; it can control up to 32 **INET 100** boxes. Order as many **INET 100** or **100B** boxes as you need for your system (each **INET 100** box has connections for 16 single-ended or 8 differential signals, plus 8 digital I/O lines and 8 analog outputs). If your sensors are in multiple locations, place an **INET 100** box near each group of sensors, minimizing sensor lead lengths. This is by far the best way to reduce noise in your system.

Use 25-pin cables (**CBL 25xx**) between each box (one 10-foot cable comes with each **INET 100** box). If using 4 or more boxes, or long *instruNet* cable runs, use a power adapter (**INET 300**) or opto-isolator (**INET 330**) to place an additional in-line power supply (**INET 311**) onto the system, between *instruNet* boxes. The opto-isolator provides optical isolation of all signal lines, *and* it provides a way to add a power supply to boxes further down the chain. No power adapter is needed for the first 4 boxes, or 100 feet of cable, whichever comes first.

Features:

- High Accuracy Data Acq. Boxes attach to Windows 95/NT & Macintosh Computers.
- Each Box: 16 SE/8 Diff. 14-bit analog inputs, 8 analog outputs, & 8 digital I/O lines.
- Reduce noise by placing boxes near sensors, up to **1000 feet** from noisy computer.
- Signal Conditioning Amplifiers on each input.
- Direct Connect to Thermocouples, RTDs, Thermistors, Voltage, Current, & Bridges.
- Returns Engineering Units.
- 166k samples/sec to RAM or to Disk.
- Includes Strip Chart/Scope Software.
- Boxes powered by 32-bit DSP PCI card in computer (PC or Mac). Call for PCMCIA.
- Works with C, Visual Basic, HP VEE, TestPoint, & SuperScope II. LabVIEW drivers available.
- Each channel is independently programmable for analog filters, integration time, voltage range, and sample rate.
- Programmable Digital Filters built-in on All Channels (L-P, H-P, B-P, B-S).
- Rugged All-Metal Construction.

Overview

instruNet provides tens of microVolts of absolute accuracy instead of tens of milliVolts, at the same cost, and at the same throughput rates as the typical general-purpose data acquisition board. It does this with a completely different topology where the analog electronics (gain amps, A/Ds, etc.) are close to the sensor in electrically-quiet boxes outside your PC, and the noisy digital electronics are left inside the computer. The external boxes contain signal conditioning amplifiers for each channel, and can therefore directly attach to sensors such as thermocouples, YSI thermistors, RTDs, strain gauges, resistance sources, current sources, and voltage sources. The box then returns engineering units to your PC (e.g. "°C", "Volts", "Amps"). At the heart of this real-time system is a PCI, NuBus, or PCMCIA controller board that plugs into a Windows 95/NT (32-bit) or Macintosh computer (not designed for DOS or older Windows 3.x).

Specifications (typical at 25°C)[1]

16 Single-Ended / 8 Diff. Analog Inputs

Channels	16 single-ended / 8 differential
Resolution	14-bit A/D, 4µs conversion time
A/D Ranges	±5V, ±0.6V, ±78mV, ±8mV
Throughput	166k samples/sec. max. aggregate
Signal/Noise Ratio	78dB
Linearity	Diff. ±1.5 LSB; Integral: ±2 LSB
Com. Mode Voltage	±5V min. (CMRR ±80dB)
Drift	±5ppm/°C of 5V FSR Offset drift self-calibrated to 0
Input Impedance	10MΩ, 1%, 3pf
Overvoltage Prot.	±15V (power on or off)

8 Analog Outputs

Channels	8 channels, 8-bit resolution
Output Range	±5V @ 4mA source (call for 15mA ver.)
Output Protection	Short-to-ground continuous
Settling Time	4µs (to ±½LSB, ±5V step)
Accuracy	±0.4%
Coupling	±20mV Digital Coupling
Drift	±10ppm/°C of 5V FSR ±5uV/°C offset drift
Readback	See *Voltage Measurement Accuracy*

8 Digital I/O Lines

I/O Lines	8 non-latching inputs and 8 latching outputs at 8 bidirectional screw terminals
Input Levels	V_{IH} = 3.2V min. to 12V max. V_{IL} = 1.0V max. to –12V min. I_{IH} = –200µA, Vi = 3.2V I_{IL} = –0.5mA max.
Output Levels	V_{OH} = 2V min. to 5V max. I_{OH} = –0.5mA max. I_{OL} = 500mA max., V_O = 1.7V I_{OL} = 50mA max., V_O = 0.7V

Current Measurement Accuracy[1,3]

instruNet measures current directly, requiring one external shunt resistor. Figures shown below include shunt self-heating, shunt initial accuracy, and voltage measurement errors.

Current Range	Shunt Resistor	Accuracy
0 to 10µA	4.7KΩ	±6nA
0 to 100µA	4.7KΩ	±40nA
0 to 1mA	4.7KΩ	±0.4µA
0 to 20mA	10Ω	±12µA
0 to 100mA	1Ω	±0.1mA
0 to 1A	0.1Ω	±1.2mA

Voltage Measurement Accuracy[1,3]

Voltage Range	No Integration	1ms Integration
±5V	±1500µV	±700µV
±0.6V	±150µV	±75µV
±78mV	±45µV	±15µV
±8mV	±30µV	±10µV

Thermocouple Measurement Accuracy[1,2]

instruNet supports a direct connection to thermocouples with the following measurement accuracies. The table excludes thermocouple device errors, yet includes cold junction compensation, voltage measurement, and linearization errors.

Type	Range	Accuracy	Type	Range	Accuracy
J	–210 to –100°C	±0.8°C	R	–50 to 70°C	±3.5°C
	–100 to 1200°C	±0.5°C		70 to 1768°C	±2.0°C
K	–200 to –50°C	±0.8°C	S	–50 to 150°C	±2.8°C
	–50 to 1360°C	±0.6°C		150 to 1768°C	±1.8°C
T	–200 to –100°C	±0.8°C	B	250 to 600°C	±3.8°C
	–100 to 400°C	±0.5°C		600 to 1300°C	±2.0°C
E	–200 to –60°C	±0.7°C	N	–200 to –110°C	±1.3°C
	–60 to 1000°C	±0.5°C		–110 to 260°C	±0.8°C

RTD Measurement Accuracy[1,2,3]

instruNet supports a direct connection to .00385 & .00392 RTDs between 100Ω and 1KΩ, requiring one external shunt resistor. The table excludes RTD device errors, yet includes RTD & shunt self-heating, shunt initial accuracy, voltage measurement, and linearization errors.

RTD	Range	Shunt	$V_{exc.}$	Accuracy
100	0 to 200°C	1KΩ	0.5V	±0.37°C
100	0 to 850°C	2KΩ	0.45V	±1°C
500	0 to 200°C	4.7KΩ	0.45V	±0.38°C
500	0 to 850°C	10KΩ	4.5V	±0.9°C
1000	0 to 200°C	10KΩ	0.5V	±0.36°C
1000	0 to 850°C	20KΩ	4.5V	±0.85°C

Thermistor Measurement Accuracy[1,2,3]

Supports a direct connection to YSI & 400-series thermistors, requiring one external shunt resistor. Excludes thermistor device errors, yet includes thermistor & shunt self-heating, shunt initial accuracy, voltage measurement, and linearization errors.

Thermistor	Range	Shunt	$V_{exc.}$	Accuracy
2252	–80 to 40°C	47KΩ	0.55V	±0.2°C
2252	0 to 70°C	4.7KΩ	0.55V	±0.1°C
2252	0 to 200°C	200Ω	0.55V	±0.4°C
10K	–80 to 40°C	100KΩ	0.55V	±0.3°C
10K	0 to 70°C	10KΩ	0.55V	±0.1°C
10K	0 to 250°C	2KΩ	0.55V	±0.16°C

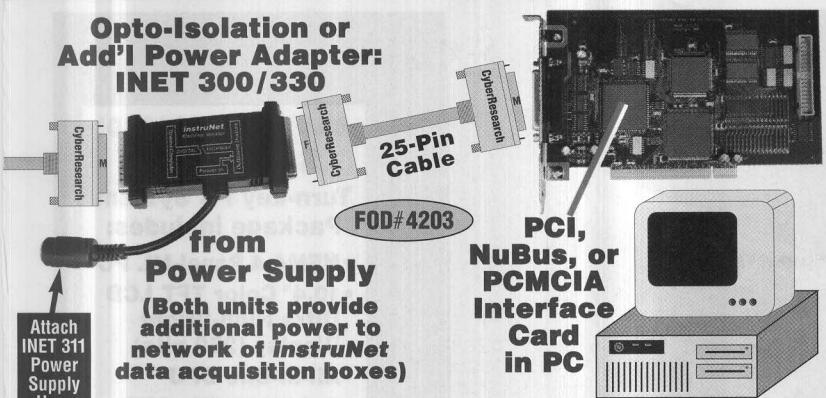
Resistance Measurement Accuracy[1,3]

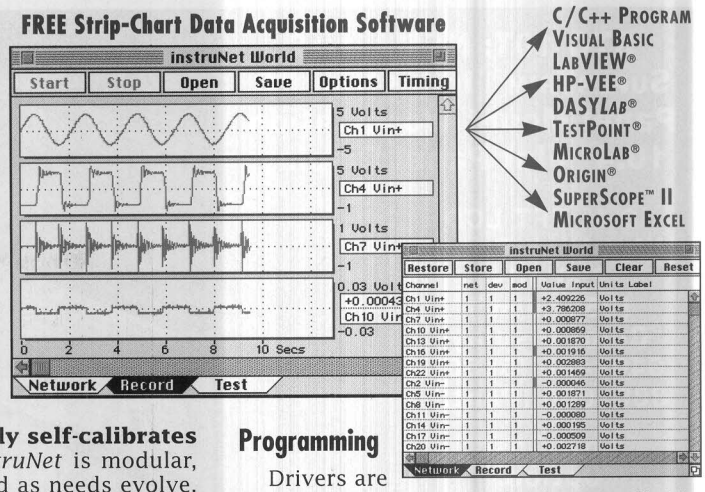
Resistance Range	Shunt	Vexc	Accuracy
0 to 100Ω	10KΩ	4.9V	±0.14Ω
0 to 1KΩ	10KΩ	4.9V	±0.8Ω
0 to 10KΩ	100KΩ	4.9V	±6Ω
0 to 100KΩ	100KΩ	4.9V	±120Ω
0 to 1MΩ	1MΩ	4.9V	±2.4KΩ

1 0 to 70°C, no condensation, INET 100xx Rev. 3.
2 Integration is set to 0.001 seconds. Temperature has not changed since self-calibration.
3 Uses a Caddock #TN130-(Ω)-0.025%-20 (0.025% initial accuracy, 20ppm/°C) shunt resistor.

CyberResearch Assistance: Toll-Free 1-800-341-2525 (USA) ☎ Tel: 203-483-8815 Fax: 203-483-9024
Applications Engineers: Mon-Fri, 9AM-5PM U.S. Eastern Time • **Internet Website:** http://www.cyberresearch.com • **Fax-on-Demand System:** 203-483-9966 • **BBS:** 203-488-8949

REMOTE 14-BIT A/D: INSTRUNET™ DATA ACQUISITION SYSTEM





Each controller contains a 32-bit microprocessor with 256KB of RAM that manages the external "network" of devices. All real-time tasks are off-loaded to this processor, therefore the host computer is not burdened with real-time issues.

Each *instruNet* 100 Box provides:

- 16 s.e./8 diff. 14-bit Analog Inputs with ±5V, ±0.6V, ±78mV & ±8mV ranges.
- 8 ±5V 8-bit Analog Outputs (D/A)
- 8 High-Current Digital I/O Lines

The *instruNet* 100 includes 44 screw terminals; the 100B adds 16 quick-connect BNC connectors for the analog inputs. In addition, the controller cards provide 10 counter/timer channels that can each function as a digital input bit, a digital output bit, a clock output channel, or a period measurement input channel. These channels may be brought out from the PC via a separate 34-pin connector.

FREE Strip Chart Software

"instruNet World" is a FREE application program. It manages, monitors & operates the instruNet system. It digitizes long continuous waveforms, spools them to disk, views incoming waveforms in real-time and then allows post-acquisition viewing — much like an oscilloscope or strip chart recorder. *instruNet World* provides a spreadsheet-like environment where one can set and view channel parameters such as sensor type, integration time, analog filter, and digital filter. Each channel has it's own row in the spreadsheet, with the various options in the columns.

Performance

The *instruNet* system supports the digitizing of multiple channels at a maximum aggregate sample rate of 166ks/sec, where each channel can be digitized at it's own rate. This maximum rate may decrease as system complexity increases – call for info. Each channel can be independently digitally filtered with low-pass, high-pass, band-stop, & band-pass filters; the filter specification for each channel is easily set via software, with a user-programmable A/D measurement integration time.

The *instruNet* network can be hundreds of feet long (1000 ft. max.) and can support multiple hardware devices connected together in a daisy-chain configuration. The start of digitizing can be triggered off of any channel. There are **no jumpers or pots;** the system **automatically self-calibrates** on power-up. Since *instruNet* is modular, it can easily be expanded as needs evolve. One can easily move the system hardware from one computer to another (even PC to Mac), since the various controllers are functionally identical. This brings up an important point that makes the *instruNet* unique: the auto-calibrating functions of the external **INET 100** data acquisition module allow *any* PC with an INET 200-series controller to be connected to an *instruNet* network of data acquisition boxes. The computer can then be powered on and be acquiring data in seconds without any setup by the operator — no sensor calibration or software setup is needed, as long as the PC has previously been used with the particular sensor net.

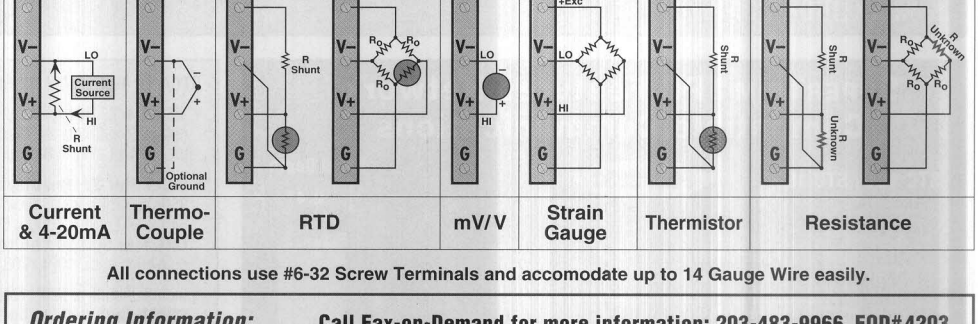
Programming

Drivers are **included at no cost** which are callable from any 32-bit C compiler or Visual Basic ≥ 4.0. This involves 1 main routine, "iNet( )", that reads or writes any of the options or channels on the system. **FREE 32-bit DLLs for Windows 95 & Windows NT 4.0+.**

Software Compatibility

The *instruNet* system is compatible with **HP VEE**, **DASY*Lab***, **TestPoint**, **MicroLab**, **Origin**, SuperScope II (Mac), & MS Excel ≥ 8.0 for Windows software. Drivers are available for LabVIEW (Mac & Win95). System is easily controlled with any 32-bit C compiler or Visual BASIC ≥ 4.0 (drivers included free). **32-bit support included for Win95 & NT.**

Typical Connections for Various Transducer Types



All connections use #6-32 Screw Terminals and accomodate up to 14 Gauge Wire easily.

Ordering Information: **Call Fax-on-Demand for more information: 203-483-9966 FOD#4203**

#INET 100	*instruNet* External A/D Box with 10-foot Cable (requires INET 200-series Controller Card) .... 16 Single-Ended or 8 Differential 14-bit A/D Channels, 8 Analog Outputs, 8 Digital I/O Lines, w/screw terminals.	**$890**
#INET 100B	*instruNet* External A/D Box (same as INET 100, w/add'l 16 BNC Connectors for easy wiring)	**$990**
#INET 200	PCI-Bus Controller Card for Windows 95 or Macintosh (controls up to 32 *instruNet* boxes)	**$590**
#INET 220	NuBus Controller Card for Macintosh (controls up to 32 INET 100-series A/D boxes)	**$590**
#INET 230	PCMCIA Controller Card, Type II, Available Soon – Call for delivery	**$590**
#INET 300	Power Adapter, if using 4 or more INET 100 boxes, (no signal isolation, requires a power supply)	**$60**
#INET 330	Optical Isolator, isolates power ***and*** signal lines (replaces INET 300; requires a power supply)	**$290**
#INET 311	Power Supply, 110V to +5V & ±12V; used w/INET 300 or 330 isolators (use 1 per 3 add'l boxes)	**$60**
#INET 340	DIN Rail Mounting Brackets for one INET 100-series device	**$50**
#INET 380	LabVIEW 4.0 Driver Pkg w/1 year of updates & technical support via e-mail (Win95 & Mac)	**$195**
#INET 34S	34-pin Screw Terminal Panel, breaks out I/O connector on INET 200 Controllers (cable req'd)	**$75**
#CBL 3403	3-foot 34-pin Ribbon Cable, to connect INET 34S to I/O on INET 200-series Controller Card	**$25**
#CBL 2525	25-foot Shielded 25-pin Molded M-F Cable, to interconnect between *instruNet* devices	**$25**
#CBL 2550	50-foot Shielded 25-pin Molded M-F Cable, to interconnect between *instruNet* devices	**$50**
#CBL 25100	100-foot Shielded 25-pin Molded M-F Cable, to interconnect between *instruNet* devices	**$100**

Each system requires at least one **INET 200**-series controller card, plus one or more **INET 100**-series external A/D boxes. Each **INET 100** box comes with a 10-foot cable; for longer distances use our **CBL 2500**-series cables shown above.

NEMA 4/12 INDUSTRIAL PANEL-MOUNT PC SYSTEMS

STC 10T: NEMA 4/12 SUPERTRIM™ Industrial PC Panel Mount Workstation 10.4" Flat Panel Display

10.4" TFT LCD Ultra High-Bright 250 nits (250 cd/m²) Color Display 640x480 (5x86) 800x600 (Pent.)

Low-Cost Option: 10.4" STN LCD 130 nits (130 cd/m²) Dual Scan Color Display 640x480

5x86-133MHz All-in-One AMD CPU

Optional: Pentium-133MHz All-in-One CPU

Other optional CPUs: Pentium 166-200MHz & MMX 166-233MHz

with optional Resistive Touch Screen

SAVE up to $1000!

SUPERTRIM™ Turn-key PC System Package includes:

- NEMA 4 Panel-Mt. PC
- 10.4" Color TFT LCD Ultra High-Bright Display (250 nits)
- All-in-One CPU
- 5x86-133 MHz AMD (Pentium optional)
- 16MB RAM/512K SSD
- 1.4 GB Hard Disk
- 4 Serial & 1 Par. Port
- Ethernet 10Base-T
- 50W Power Supply
- MS-DOS (Win95: $199)

Total Price $2995

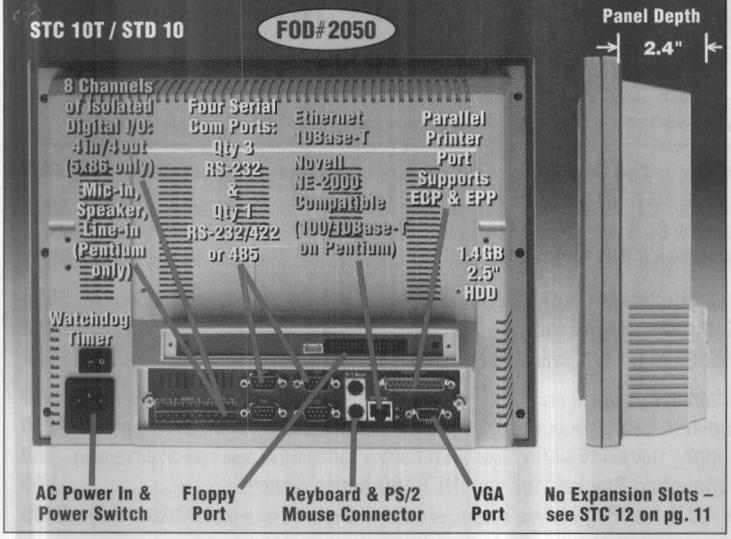
Optional Touch Screen: $400

Save $500 with NEW STN Dual Scan LCD Display (130 nits)

FOD#2050

SUPERTRIM™ PC Features Network Compatible Communications

STC 10T / STD 10 **FOD#2050**



- **All-in-One CPU** with Watchdog Timer: **5x86-133MHz w/16MB RAM (64MB max); or Pentium-133, 166, or 200MHz, or Pentium MMX-166, 200, or 233MHz w/32MB RAM (128MB max).**
- **Network-Compatible I/O: 4 serial ports**: three RS-232 and one RS-232/422/485; a **PS/2 mouse port**; **1 parallel (printer) port**; **1 ethernet port**, Novell NE-2000 (**10Base-T** on 5x86 models, **100/10Base-T** on Pentium units), and **8 digital I/O lines**, 4 in/4 out (5x86 only) **or mic-in, line-in, & speaker out** (16-bit SoundBlaster Pro compatible) on Pentium models.
- **Operating Temp:** +32 to +112°F (0 to +45°C) • **Relative Humidity:** 5-95%, non-condensing.

STC/STD 10 NEMA 4/12 Industrial Panel Mount PC SUPERTRIM™ Workstation Features:

- ***NEMA 4/12* Heavy-Duty Panel-Mount Enclosure** – 13.5" **W**ide; 10.4" **H**igh; 3.6" **D**eep w/bezel (342x265x92mm); 2.4" **D**epth behind panel (61.5mm); panel-mt. cut-out: 12.4" **W** x 9.7" **H** (315x247mm). Wt: 5.9 lbs (2.7kg). Built-in **50W** power supply (**65W** on Pentium models), 90-240VAC, 50/60Hz.
- **Color Flat Screen Display: 10.4"** Active Matrix **TFT LCD** (256K colors) **High-Bright** Display 250 nits (250 cd/m²). **10.4"** Dual Scan **STN LCD** (256K colors) **LCD** Display 130 nits (130 cd/m²). 640 x 480 pixels, (800 x 600 pixels on TFT Pentium only), 90° Viewing Angle. On-board **SVGA CRT/Flat Screen Controller** w/1 MB Video RAM. Supports simultaneous remote CRT at same resolution, max: 1024x768. Optional Analog Resistive **Touch Screen** (75% light trans.; 30M. touch life).
- Includes built-in **2.5" 1.4GB** (1400MB) **Hard Disk Drive** & **512K Solid-State Disk (Flash SRAM) included, or optional DiskOnChip (2-24MB, Pentium models only)** – see pg. 42. Connector provided for optional Remote-Mounting Floppy Disk Drive (call for information.)

Ordering Information: ***Pricing & Specifications Subject to Change – CALL!***

10.4" LCD SuperTrim™ Panel-Mt. PC w/ Built-in 5x86 or Pentium CPU

#STD 10 SuperTrim Pkg. w/5x86, 16MB RAM, 1.4GB HDD, **10.4" STN** LCD, etc....**$2495**
#STC 10T SuperTrim Pkg. w/5x86, 16MB RAM, 1.4GB HDD, **10.4" TFT** LCD, etc....**$2995**

#STD 10PEN-xxx ST Pkg. w/Pentium-133, 32MB, 1.4GB HDD, **10.4" STN** LCD, etc..**$2895**
#STC 10PEN-xxx ST Pkg. w/Pentium-133, 32MB, 1.4GB HDD, **10.4" TFT** (800x600)..**$3395**
Replace **-xxx** with **-133** for Pentium-133MHz; for **-166** MHz add $50; for **-200** MHz add $150.

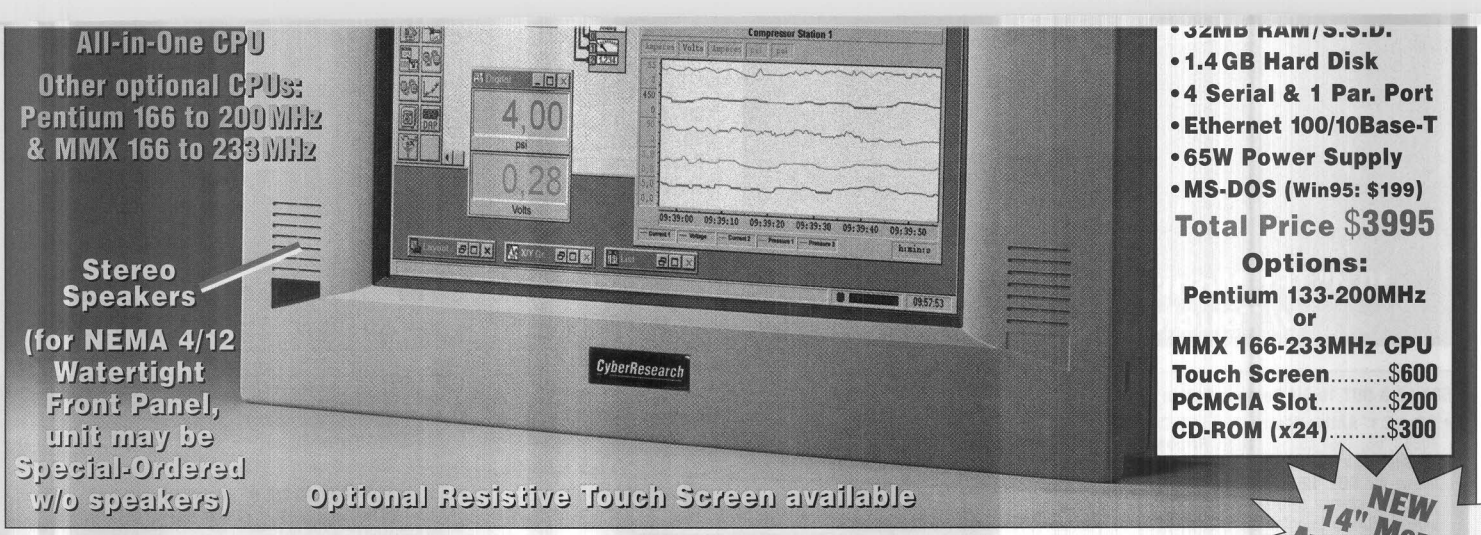
#STD 10PMX-xxx ST Pkg. w/Pent.-166MMX, 32MB, 1.4GB HDD, **10.4" STN** LCD, etc..**$2995**
#STC 10PMX-xxx ST Pkg. w/Pent.-166MMX, 32MB, 1.4GB HDD, **10.4" TFT** (800x600)..**$3495**
Replace **-xxx** with **-133** for Pentium MMX-133MHz; for **-200** MHz add $200; for **-233** MHz add $400.

#STD 10TU Analog Resistive **Touch Screen** option for STC 10 or STD 10...**$400**

#MSD W95R Windows 95 (with purchase of a system).....**$199**

Note – Package includes: PC with 10.4" STN Dual Scan or TFT LCD **Display**, **5x86 or Pentium-133MHz to 233MMX CPU**, **16 or 32MB RAM** (64MB max on 5x86, 128MB max on Pentium), a **2.5" 1.4GB** (1400MB) **Hard Drive, I/O** (see box at left), & **MS-DOS.** For additional memory see page 38. Call for optional external 3.5" floppy drive. Accessories start on pg. 40 including: DiskOnChip, keyboards, printers, surge protectors, UPSs, etc.

CyberResearch Assistance: Toll-Free 1-800-341-2525 (USA) Tel: 203-483-8815 Fax: 203-483-9024
Applications Engineers: Mon-Fri, 9AM-5PM U.S. Eastern Time • **Internet Website:** http://www.cyberresearch.com • **Fax-on-Demand System:** 203-483-9966 • **BBS:** 203-488-8949



STC 12 Industrial / Multimedia Panel-Mount SuperTrim™ PC Workstation features:

- **Heavy-Duty Extremely Compact Panel-Mount Enclosure** (***NEMA 4/12*** *available via Special Order without speakers)* – 14.7"**W**ide; 11.3"**H**igh; 4.2"**D**eep w/bezel (373x287x107mm); 3.7"**D**epth behind panel (94mm); panel-mount cut-out: 14.4"**W**x10.8"**H** (365x274mm). Weight: 10lbs (4.6kg). Built-in **65-Watt** Power Supply, 90-240VAC, 50/60Hz.
- One half-length expansion slot which can accept 1 **PCI**-bus or 1 **ISA**-bus expansion card.
- **Color Flat Screen Display: 12.1"** Active Matrix **TFT LCD** (256K colors) **Ultra High-Bright** Display, 250nits (250cd/m²), 800 x 600 pixels, 90° viewing angle, 0.33x0.33mm dot size. On-board **SVGA CRT/Flat Screen Controller** w/1MB Video RAM. Supports simultaneous remote CRT at same resolution, max: 1024x768. Optional Analog Resistive **Touch Screen** (75% Light Trans.; 30M. touch life).
- **All-in-One CPU** with Watchdog Timer: **choice of Pentium-133, 166, or 200MHz, or PentiumMMX-166, 200, or 233MHz. All models come with 32MB RAM** (128MB max).
- Includes built-in **2.5" 1.4GB** (1400MB) **Hard Disk Drive, 1.44MB Floppy Drive,** & a **512K Solid-State Disk (Flash SRAM), or optional DiskOnChip (2-24MB)** – see page 42.
- **Network-Compatible I/O: 4 serial ports**: three RS-232 and one RS-232/422/485; a **PS/2 mouse port**; **1 parallel (printer) port**; **1 ethernet port**, Novell NE-2000 (**100/10Base-T**); and **mic-in, line-in, & speaker out** (16-bit SoundBlaster Pro compatible).
- **Operating Temp:** +32 to +112°F (0 to +45°C) • **Relative Humidity:** 5-95%, non-condensing.

Ordering Information: ***Pricing & Specifications Subject to Change – CALL!***

12.1" TFT LCD SuperTrim™ Panel-Mount PC with Pentium CPU

#STC 12PEN-xxx ST Pkg. w/Pentium-133, 32MB, 1.4GB HDD, **12.1" TFT** (800x600)..**$3995**
Replace **-xxx** with **-133** for Pentium-133MHz; for **-166** MHz add $50; for **-200** MHz add $150.

#STC 12PMX-xxx ST Pkg. w/Pent.-166MMX, 32MB, 1.4GB HDD, **12.1" TFT** (800x600)..**$4095**
Replace **-xxx** with **-133** for Pentium MMX-133MHz; for **-200** MHz add $200; for **-233** MHz add $400.

#STC 12TU Analog Resistive **Touch Screen** for STC 12.....**$600**

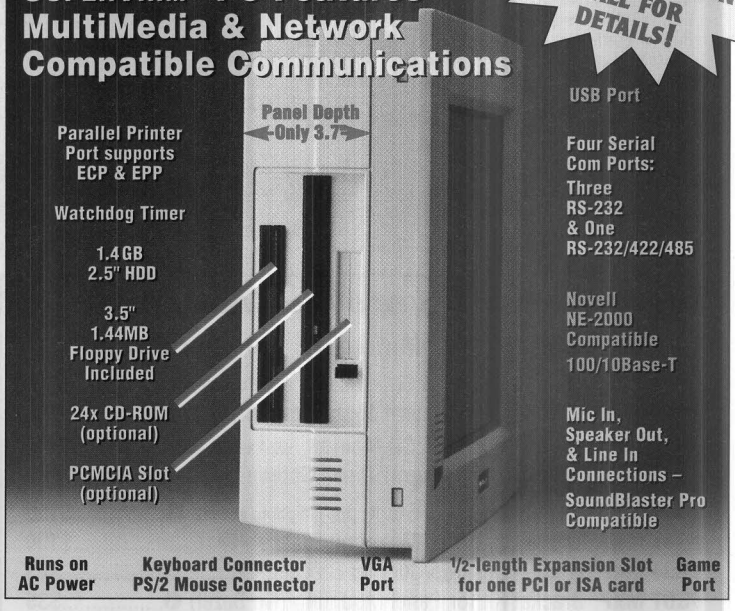
Note – Package includes: PC w/**12.1" TFT LCD Display, Pentium-133MHz to 233MMX CPU, 32MB RAM** (128MB max), a **2.5" 1.4GB** (1400MB) **Hard Drive, 1.44MB Floppy Drive, I/O** (see box above), and **MS-DOS.** For additional memory see page 38. Accessories start on pg. 40 including: DiskOnChip, keyboards, printers, surge protectors, UPSs, etc.

For additional expansion slots, see our Flat Panel Workstaions on pages 18-21.

Specifications and pricing subject to change – call for latest Information. FOD# 2051

SuperTrim™ PC Features MultiMedia & Network Compatible Communications

NEW 14" Models Available Soon Call for Details!



Optional Accessories for STC 12 SuperTrim™ Panel-Mount PC

#STC 12CDI	Internal 24x CD-ROM Drive for STC 12 – see photo above	**$300**
#STC 12PCM	PCMCIA Upgrade for STC 12 – see photo above	**$200**
#STC 12TU	Analog Resistive **Touch Screen** for STC 12	**$600**
#MSD W95R	Windows 95 (with purchase of a system)	**$199**

Additional accessories start on page 40. Call for the latest pricing, accessories, and options.

HIGH PERFORMANCE FLAT-SCREEN TFT LCD MONITORS

CyberResearch All-Purpose Flat-Screen Color Monitors: Low Cost, Compact Size, 10.4" to 14.1" TFT Color

GDT 10T Flat-Panel Monitor • 10.4" TFT Color Display

10.4" TFT Monitor Only: $1895!
w/ Touch Screen: $2195!

GDT 12 Flat-Panel Monitor 12.1" TFT Color Display

NEW Models Available Soon:
- 14" TFT Display
- Lower-Cost 12.1" with 800 x 600 TFT LCD
- High-Bright option: 200 nits for 10.4"

Call for details!

12.1" TFT Monitor only: $2995!
w/ Touch Screen: $3295!

Swivel Mount Optional FOD#2161

GDT 12 & GDT 10 All-Purpose Active Matrix TFT Color Monitors Feature:

- **12: 12.1" Active Matrix TFT LCD Color Flat Screen Monitor** — Resolution: 1024x768, 16M colors. **High Bright** Display: 200 nits (200cd/m²), *three times brighter than a standard notebook PC.* Contrast Ratio 150:1. Built-in interface allows the **GDT 12** monitor to be driven from any standard VGA, SVGA, & XVGA port. *No special card required.* Response time 40ms – suitable for full motion video. Monitor brightness and contrast controls are accessible from the rear panel. Low Power consumption: 24 Watts (provided by supplied low-voltage switching power supply, 90-240VAC, 50/60Hz input; 12VDC@3A output).
- **10: 10.4" Active Matrix TFT LCD Color Flat Screen Display** — Resolution: 640x480, 256K colors. Display Brightness: 80 nits (80cd/m²). Contrast Ratio 60:1. Built-in interface allows the **GDT 12** or **10** monitor to be driven from any standard VGA port. *No special card required.* Response time: 30ms rise, 50ms decay. Monitor brightness and contrast controls are accessible from the front panel. Low power consumption: 5.5 Watts (provided by supplied low-voltage 22W wall-mount power supply, 120VAC input, 12VDC@1 Amp output). VGA: standard 15-pin connector. Touch Screen: standard 9-pin D-Sub connector on included 5-foot cable.
- **Optional Resistive Touch Screen** only $300 extra; interfaces via a standard serial port.
- **Operating Temp:** +32 to +104°F (0 to +40°C). • **Storage Temp:** –13 to +140°F (–25 to +60°C).
- **Relative Humidity:** 5-95%, non-condensing.

- **NEMA 1 Extremely Compact Enclosure:** Rugged construction ideal for industrial use. All joints sealed with rubber gaskets. Sealed control buttons. Sealed housing made of ABS/copper & cast zinc alloy **(GDT 10T)** or ABS/copper & cast aluminum alloy **(GDT 12T).**
- **GDT 12 (12.1" diagonal)** is only 11.9" **W**ide; 9.4" **H**igh; 2.0" **D**eep (302**W** x 238**H** x 51**D** mm). Weight: 5.5 lbs (2.5 kg). **GDT 10 (10.4" diagonal)** is only 11.25" **W**ide, 8" **H**igh; 1.36" **D**eep (285**W** x 203**H** x 34.5**D** mm). Weight: 4.8 lbs. (2.2 kg).
- **5 Mounting options** include wall, panel, and desktop swivel brackets.

For more details call our *Fax-on-Demand System: 203-483-9966, FOD#2162.*

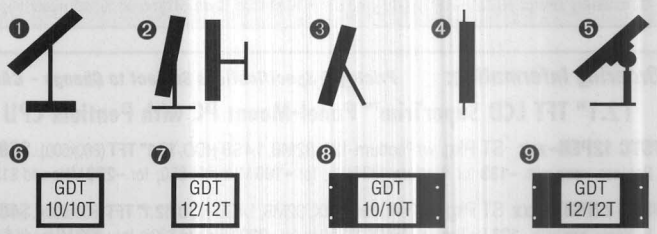
CyberResearch offers a wide selection of high performance monochrome & color Flat Panel Monitors which are state-of-the-art alternatives to traditional CRT Monitors. These monitors offer the traditional benefits of flat panel displays — small size, thin profile (less than 2 inches thick), light weight, and low power consumption — plus the security of a rugged enclosure which you can panel, wall, or bracket-mount. Many new models will become available soon featuring higher resolution and larger screen sizes — call for details. Quantity discounts are available for volume buyers.

Ordering Information: ***Call Fax-on-Demand: FOD#2160** (10) **& 2162** (12)*

All-Purpose Active Matrix TFT LCD Color Monitor

#GDT 10	**10.4" Color TFT LCD Monitor,** 640 x 480, 80 nits	**$1895**
#GDT 10T	**GDT 10 with Integral Touch Screen**	**$2195**
#GDT 12	**12.1" Color TFT LCD Monitor,** 1024 x 768, 200 nits	**$2995**
#GDT 12T	**GDT 12 with Integral Touch Screen**	**$3295**
#GDT MKD	Desktop/Counter Stand (top left photo above) ❶	**$150**
#GDT MKT	Tilting Wall/Base Mounting Bracket ❷	**$100**
#GDT MKF	Folding Desktop/Counter Bracket ❸	**$85**
#GDT MKP	Bracket Kit for Panel Mounting (No Bezel) ❹	**$35**
#GDT SVP	Industrial Swivel Mount Bracket: GDT 10 & 10T ❺	**$100**
#GDT SVP9	Industrial Swivel Mount Bracket: GDT 12 & 12T ❺	**$100**
#GDT PK1	Panel Mounting Bracket Kit **w/Bezel;** GDT 10/10T ❻	**$135**
#GDT PK2	Panel Mounting Bracket Kit **w/Bezel;** GDT 12/12T ❼	**$135**
#GDT RK1	Rack Mounting Kit **for EIA 19" Rack;** GDT 10/10T ❽	**$150**
#GDT RK2	Rack Mounting Kit **for EIA 19" Rack;** GDT 12/12T ❾	**$150**

Optional Mounting Brackets, Stands & Panels for GDT 10/10T/12/12T TFT LCD Color Monitors



❻	❼	❽	❾
GDT 10/10T	GDT 12/12T	GDT 10/10T	GDT 12/12T
WxH 12.75" x 9" 324 x 229mm	13.5" x 10.5" 343" x 267mm	19" x 10.5" (6RU) 483 x 267mm	19" x 10.5" (6RU) 483 x 267mm

- **Optional GDT 10/12 Monitor Mounting Accessories: Desktop/Counter-Mount Stand, Tilting Wall/Base Stand, Folding Desktop/Counter Bracket, Panel-Mount Bracket** (does not include bezel), **Industrial Swivel Bracket, Panel-Mount** with Bezel, **Rack-Mount** with 19" Rack Panel, and the **Rack-Mount Fold-Away™** (Lexan Window optional – see page 13).

CyberResearch Assistance: Toll-Free 1-800-341-2525 (USA) ☎ Tel: 203-483-8815 Fax: 203-483-9024
Applications Engineers: Mon-Fri, 9AM-5PM U.S. Eastern Time • **Internet Website:** http://www.cyberresearch.com • **Fax-on-Demand System:** 203-483-9966 • **BBS:** 203-488-8949

NXT 12T: NEMA 4/12 Panel-Mount Industrial PC with 12.1" TFT High Bright Display

SAVE up to $1000!

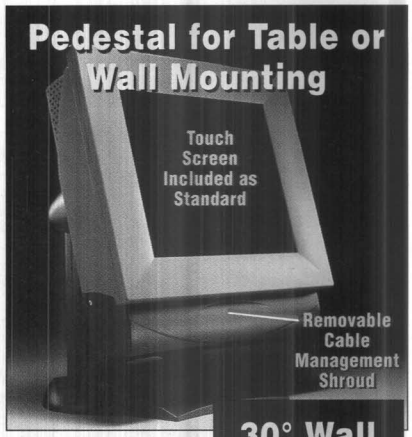
12.1" TFT LCD DISPLAY

Turn-key PC System Package includes:

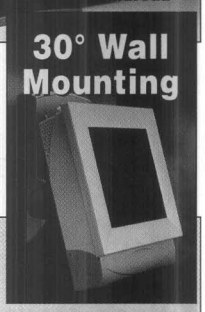
- NEMA 4 Panel-Mt. PC
- 12.1" Color TFT LCD
- Touch Screen
- 5x86-133MHz AMD CPU
- 16MB RAM/512K SSD
- 1.4GB 2.5" HDD
- 1 PCI or ISA 1/2-Length Expansion Slot
- 4 Serial & 1 Par. Port
- Ethernet 10Base-T
- 65W Power Supply
- MS-DOS (Win95: $199)

Total Price $4495

Pedestal for Table or Wall Mounting



Pedestal can be adjusted for 30° Table or 30° Wall Mounting

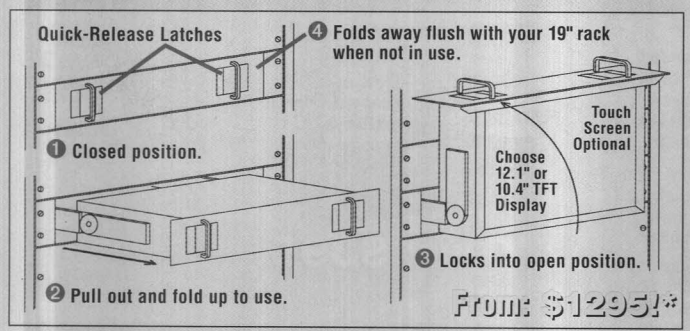


NXT 12T NEMA 4/12 Industrial Panel-Mount PC with 12.1" TFT LCD Display Features:

- ***NEMA 4/12* Heavy Duty Extremely Compact Panel-Mount Enclosure.** 14.2" **W**ide; 10.9" **H**igh; 3.3" **D**eep w/bezel (360x277x82mm), 2.4" **D**epth behind panel (60mm); panel-mount cut-out: approx. 13.3" **W**, 10" **H** (337x254mm). Front panel is NEMA 4 watertight when panel mounted with gasket (rear of enclosure is not NEMA 4). Weight 32lbs (14.6kg). Built-in **65W** power supply, 90-240VAC, 50/60Hz.
- **Mounting** (pedestal included): **Panel-Mount, Table/Wall-Mount, or 30° Table/Wall-Mount.**
- **All-in-One PC Board, 5x86-133MHz CPU, 16MB (64MB max),** and a **Watchdog Timer.**
- One built-in **2.5" 1.4GB** (1400MB) **Hard Disk Drive** & **512K Solid-State Disk** (Flash SRAM) **included.** Connector provided for optional Remote Mounting Floppy Disk Drive (call for info).
- **Color Flat-Screen Display: 12.1"** Active Matrix **TFT LCD** (up to 128K colors), **High-Brightness** (160cd/m²), 800 x 600 pixels. Analog Resistive **Touch Screen included** (w/RS-232 controller, 30 million touch life). On-board **SVGA CRT/Flat Screen Controller** with 1MB of Video RAM (2MB max) – supports a simultaneous SVGA CRT at same resolution, up to 1024x768 max.
- **Expansion Capability: 1 PC/104 slot,** optional riser card accepts 1 half-length **ISA or PCI card.**
- **Network Compatible I/O: 4 Serial ports**: three RS-232 & one 232/422/485; **1 Parallel port**, **Ethernet port** Novell NE-2000/10Base-T (RJ-45), and 8 channels of **Digital I/O**, 4in/4out.
- **Operating Temp:** +32 to +104°F (0 to +40°C) • **Relative Humidity:** 5-95%, non-condensing.

GDTF FoldAway™ Rack Mount Kits for GDT 10/10T/12/12T Color TFT LCD Monitors

If you have a shortage of Rack Space, mount your Flat Panel Monitor in the Space-Saving Answer – the GDTF 200 FoldAway Rack-Mount Kit!

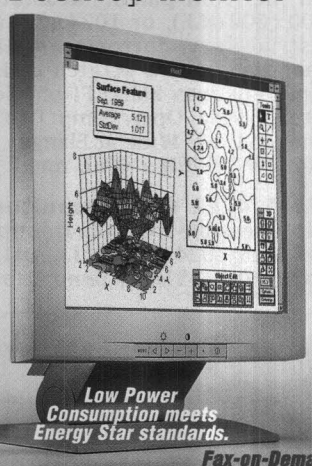


GDTF 200 & 201 Folding Flat-Screen LCD Monitor Rack-Mounting Kit

- **Monitor:** Designed for use with **GDT 10, 10T, 12, and 12T.** Can be modified to work with other flat-panel monitor models on a Special Order basis — call for details.
- **Protective Lexan Window:** Included with the **GDTF 201** (not for use with touch screen).
- 19" **W**ide at flanges; only 3.5" **H**igh (2 Rack Units); 24" **D**eep. (483**W**x356**H**x610**D**mm). Designed for use in any EIA 19" rack with a rack depth of 24" to 25".

Call for details on this CyberResearch-exclusive product. FOD#2168

GDV-14 Color TFT Desktop Monitor



Fax-on-Demand

Only: $2895 FOD#2174

New 14" LCD!

ACTIVE MATRIX COLOR TFT FLAT-PANEL LCD MONITOR

Package includes:

- 14" Color TFT LCD — Equivalent to Viewing Area of a 15" CRT!
- Desktop-Mounting Stand
- Molded Plastic Housing
- Resolution: 1024x768
- High Bright: 180 nits (180 cd/m²)

Total Price $2895

Optional Wall-Mount Bracket – see page 4A.

Ordering Information: **Call Fax-on-Demand for more info: 203-483-9966**

NEMA 4 Panel-Mount PC System with: **12.1"** TFT w/Touch-Screen (800x600), AMD 5x86-133 CPU, DOS, 16MB RAM, 65W Power Supply, 1.4GB HDD, optional ISA slot

#NXT 12T Panel-Mt. PC Pkg. w/5x86, 16MB, 1.4GB HDD, 12.1" TFT, T-S, etc. **$4495**

#NXT 10R Expansion Slot Riser Card, adds 1 ISA or 1 PCI half-length slot... **$50**

#GDV 14 14.1" Color TFT Desktop Monitor, 1024x768 XVGA..... **$2895**
Note: Detachable Desktop Mounting Stand included in the price of the **GDV 14** monitor.

#GDV 14W Wall-Mount Bracket for GDV 14 Monitor..... **$300**

#GDTF 200 FoldAway™ Rack-Mount Kit for LCD Monitor..... **$1295***

#GDTF 201 GDTF 200 with Protective Lexan Window..... **$1495***

Note: **Price does not include cost of LCD Monitor.* Suitable for use w/**GDT 10, 10T, 12, & 12T.** The FoldAway™ Rack-Mount Kit can be used with other monitors on a Special Order basis.

CyberResearch Rack-Mount Monitors — Designed Specifically for Use in Harsh Industrial Environments

GRX 1014 Rack-Mount 14" SVGA Color Monitor

GRR 5015 15" NEMA 4/12 Industrial Rack Monitor

Rack-Mount Color Monitors

A key component of any rack-mount PC system is the monitor. CyberResearch Industrial Monitors are designed and built for the factory floor environment. A wide variety of panel and rack-mounting monitors are available with a choice of color CRTs, DSTN/Dual-Scan color, or active matrix TFT color flat-panel LCD displays (see pages 8 to 13 for flat-screen display details).

- **GRX 1014 14" Color monitor** — Monitor brightness & contrast controls are accessible from the front panel. Resolutions: 640x480 (Non-Interlaced), 800x600 (N.I.), or 1024x768 (Int.). **NEMA 1 Enclosure:** Industrial-duty, corrosion-resistant chassis. Front panel and handles have a scratch-resistant finish. Fully-enclosed frame ensures EMI/RFI shielding. Dot Pitch: 0.28 mm; Bandwidth: 65 MHz; Oper. Temp: 0 to 45°C. Weight: 24.8 lbs (11.3kg) Dimensions: 19" **W**ide at Flanges; only 8 RU / 14" **H**igh; 16" **D**eep. (483**W** x 356**H** x 406**D** mm.)
- **GRR 5015/17: 15/17" NEMA 4/12 Color monitors** — Brightness & contrast controls accessible from the front panel. Resolutions: 640x480, 800x600, or 1024x768 (N.I.), or 1280x1024 (Int.). Pitch: 0.28 mm; Bandwidth: 85 MHz; Temp: 0 to 50°C.

15", 17", & 20" NEMA 4/12 Color Monitors

Our new **GRM 4000 & GRR 5000 Series** Industrial Monitors are ultra-high resolution digital video monitors with sealed front panels which meet NEMA 4/12 standards when mounted in an appropriate enclosure. Fan cooling is provided to allow operation to 50°C/122°F. A digital control system provides easy adjustment of image geometry and color balance. Multi-sync capability ensures compatibility with IBM and VESA standards. Optional resistive, SAW, or capacitive touch screens are available to enhance the operator interface with Windows programs. An internal power supply provides power to the cooling fan and to the optional serial touch controller. Call our Fax-on-Demand (FOD) system for more info.

Accelerate your VGA Graphics and add True 24-bit Color

Our standard SVGA video card (supplied with our PCs that include integral monitors) has 1MB of VRAM. If you're running Windows, you need the speed of our PCI video cards. We strongly recommend the **GRI 04240** 3D graphics accelerator & video card when your application involves images and/or complex display graphics. It supports resolutions to 1600 x 1200, at up to 16.8 million colors (4MB VRAM supports 16.8M colors at 1280x1024). Pricing on pg. 15.

GRX 02222: 19" Rack-Mount Monitor Enclosure

Order One of Our 14" SVGA Monitors, or use the GRX 02222 to Rack-Mount Your Own Monitor

Our **GRX 02222** Rack-Mounting Monitor Enclosure Kit features a hinged front panel for easy access to monitor controls, adjustable mounting brackets, and a heavy-duty metal case which surrounds the monitor. The metal case with lexan faceplate provides protection from both environmental dangers and EMI/RFI interference. This enclosure kit will accommodate a wide variety of monitors, right out of the box.

Our affordable **Rack-Mount Color SVGA Monitor** provides an economical way to get high-resolution color graphics. SVGA provides transparent software compatibility with all the older graphics standards, allowing you to run virtually any software. Our **GRX 02231** SVGA Monitor will display SVGA, VGA, EGA, CGA, Monochrome, MCGA, and Hercules Graphics. It offers 1024 x 768 resolution (interlaced) operation with 0.28mm dot pitch.

For even better video performance, our **GRX 02241** Multi-Scan Rack-Mount Color Monitor offers a 35% faster video refresh rate, and 1024 x 768 resolution (non-interlaced) operation with 0.28mm dot pitch.

Ordering Information: **For Details Call our FAX-on-Demand: FOD#2024**

#GRX 02222	Rack-Mount Monitor Enclosure Only	**$395**
#GRX 02231	Rack-Mount Enclosure with 14" SVGA Color Monitor	**$595**
#GRX 02241	Rack-Mount Encl. with 14" Non-Interlaced SVGA Monitor	**$895**

CyberResearch Assistance: Toll-Free 1-800-341-2525 (USA) Tel: 203-483-8815 Fax: 203-483-9024
Applications Engineers: Mon-Fri, 9 AM-5 PM U.S. Eastern Time • **Internet Website:** http://www.cyberresearch.com • **Fax-on-Demand System:** 203-483-9966 • **BBS:** 203-488-8949

NEMA 4/12 Industrial Rack-Mount Monitors

GRM 4015: 15" Industrial Monitor w/ Touch Screen

Monitor Only: $1495!
w/ Touch Screen: $2495!

GRM 4015: 15" Panel or Rack-Mount Monitor includes:

- **15" Ultra-High-Resolution CRT display**. 15" diagonal, flat, square CRT screen with a viewing area of 10.63"W x 7.87"H. The CRT display has a maximum resolution of **1280 x 1024**, non-interlaced, with a 0.28mm dot pitch, medium, short persistence phosphors, tinted glass with non-glare surface, and a video bandwidth of 75MHz at –3dB.
- **Dimensions:** Rack-mount model: 19" **W**ide at flanges; only 14" **H**igh (8 Rack Units); 14.4" **D**eep (483**W** x 356**H** x 366**D** mm). Panel-mounting model: 19" **W**ide; 14.25" **H**igh; 14.4" **D**eep (483**W** x 362**H** x 366**D** mm). Weight: 35 lbs (15.9 kg).
- **NEMA 4/12 Front Panel:** Rugged sheet metal enclosure with front panel sealed to NEMA 4/12 rating. Totally self-contained with a separate power supply for fan power & an optional serial touch controller. Power Input: 110/220VAC, 50/60Hz, 100W max.

GRM 4017: 17" Industrial Monitor w/ Touch Screen

Monitor Only: $2295!
w/ Touch Screen: $3295!

GRM 4017: 17" Panel or Rack-Mount Monitor includes:

- **17" Ultra-High-Resolution CRT display**. 17" diagonal, flat, square CRT screen with a viewing area of 12.25"W x 9.12"H. The CRT display has a maximum resolution of **1280 x 1024**, non-interlaced, with a 0.28mm dot pitch, medium, short persistence phosphors, tinted glass with non-glare surface, and a video bandwidth of 110MHz at –3dB.
- **Dimensions:** Rack-mount model: 19" **W**ide at Flanges; only 15.75" **H**igh (9 Rack U.), 16.4" **D**eep (483**W** x 400**H** x 417**D** mm). Panel-mounting model: 19" **W**ide; 15.75" **H**igh; 16.4" **D**eep (483**W** x 400**H** x 417**D** mm). Weight: 48 lbs (21.8 kg).
- **NEMA 4/12 Front Panel:** Rugged sheet metal enclosure with front panel sealed to NEMA 4/12 rating. Totally self-contained with a separate power supply for fan power & an optional serial touch controller. Power Input: 110/220VAC, 50/60Hz, 120W max.

GRM 4020: 20" Industrial Monitor w/ Touch Screen

Monitor Only: $2995!
w/ Touch Screen: $3995!

GRM 4020: 20" Panel or Rack-Mount Monitor includes:

- **20" Ultra-High-Resolution CRT display**. 20" diagonal, flat, square CRT screen with a viewing area of 14.65"W x 10.71"H. The CRT display has a maximum resolution of **1600 x 1200** @ 60Hz, non-interlaced, with a 0.28mm dot pitch, medium, short persistence phosphors, tinted glass with non-glare surface, and a video bandwidth of 150MHz at –3dB.
- **Dimensions:** Rack-mount model: 19" **W**ide at flanges; only 17.5" **H**igh (10 Rack Units); 17.9" **D**eep (483**W** x 445**H** x 455**D** mm). Panel-mount model: 19" **W**ide; 17.5" **H**igh; 17.9" **D**eep (483**W** x 445**H** x 455**D** mm). Weight: 65 lbs (29.6 kg).
- **NEMA 4/12 Front Panel:** Rugged sheet metal enclosure with front panel sealed to NEMA 4/12 rating. Totally self-contained with a separate power supply for fan power & an optional serial touch controller. Power Input: 110/220VAC, 50/60Hz, 160W max.

GRM 4000 Series 15", 17", and 20" Panel or Rack-Mount Monitors include:

- **Environmental Specs.:** Operating Temperature: 0 to +50°C (32 to 122°F) (Fan cooled for operation up to +50°C.) Storage: –20°C to +60°C. Relative Humidity: 0-90%, non-condensing.
- **Radiation:** The monitor features a low-radiation design which meets MPR-II Standards. System components are UL Compliant (monitor & power supply). Meets FCC Class B Standards.
- **Digital Controls:** The Digital Control System provides easy adjustment of image geometry and color balance for different display modes. Brightness and contrast are potentiometer adjustments. A manual degauss switch is available to degauss the CRT should it become magnetized. The monitor has multi-sync capability and is compatible with IBM and VESA standards. It can be programmed and preset to operate at any frequency within the horizontal sync, vertical sync, and video range.
- **Touch Screens:** Available with a choice of Resistive or Surface Acoustic Wave (SAW) Touch Screens. **Resistive:** *Resistive:* 100,000/in²; *SAW:* 900/in². **Serial RS-232 Controllers, Touch Software Drivers, and Anti-Glare Surface Treatment included with Touch Screens.**
- **The GRM 4000 Series is ideal for system integrators & end-users who require image sharpness & clarity in a rugged NEMA 4/12 panel or rack-mount monitor. FOD#**

GRMB 4017: 17" BackPack™ Workstation

Includes: Panel or Rack-Mount 17" CRT & PC

- **BackPack™ Enclosure** includes: A **Passive Backplane** with **7 ISA-bus** full-length slots (for a total of 5 available slots; two slots required for display adapter & CPU card) or choose **7-slot PCI/ISA-bus Passive Backplane** (with 3 PCI/3 ISA/1 CPU slots – total of 5 available slots) for full-length cards. Use **All-in-One Pentium/486 CPU card** (see pp. 36-38).
- 19" **W**ide at flanges; 14" **H**igh (8 Rack Units); 19.7" **D**eep (483**W** x 356**H** x 500**D** mm). 200W power supply.
- **For details call Fax-on-Demand: FOD#2417**

GRR-Series 15" & 17" Flush-Mount Monitors

- **Display** 15 & 17" SVGA Color CRT (Max. res: 1280x1024). MicroTouch® Capacitive Touch Screen Kit optional. Controls accessible from front panel.
- **NEMA 4/12 Flush Front Panel** 19" **W**ide at flanges; **GRR 5015** is only 14" **H**igh (8 RU); 15.5" **D**eep. **GRR 5017** is 15.75"**H** (9RU); 17"**D**. (483**W** x 355/399**H** x 393/430**D** mm). Wt: 44/59 lbs (20/25.3 kg). Temp: 0-40°C. Rack Slides recommended.

Call Fax-on-Demand: FOD#2425

Ordering Information: **Call Fax-on-Demand for info: 203-483-9966**

NEMA 1 Rack-Mount Color CRT Monitor

#**GRX 1014** 14" SVGA Color CRT Rack-Mount Monitor (NEMA 1)....**$895**

NEMA 4/12 Panel and Rack-Mount CRT Monitors

#**GRM 4015** 15" SVGA Color CRT Rack-Mt Monitor (NEMA 4).....**$1495**
#**GRM 4017** 17" SVGA Color CRT Rack-Mt Monitor (NEMA 4).....**$2295**
#**GRM 4020** 20" SVGA Color CRT Rack-Mt Monitor (NEMA 4) **$2995**

Add **–P** Suffix to GRM Rack-Mt Monitor Part Number for **Panel-Mount Option**.....**$NC**
Add **–TR** Suffix to GRM Monitor Part Number for **15-20" Touch Screen (Resistive)**.....**$1000**
Add **–TS** Suffix to GRM Monitor Part Number for **15-20" Touch Screen (SAW)**.....**$1000**

NEMA 4 Panel & Rack-Mt CRT Workstations: 7 PCI/ISA Slots*

#**GRMB 4017** 17" Rack-Mt. Workstation w/SVGA CRT (NEMA 4) ISA..**$2795**
#**GRMB 4017P** 17" Rack-Mt. Workst. w/SVGA CRT (NEMA 4) PCI Bus..**$2995**

Add **–P** Suffix to GRMB Rack-Mt. Workstation Part # for **Panel-Mount Option**.....**$NC**
Add **–TR** Suffix to GRMB Workstation Part # for **17" Touch Screen (Resistive)**.....**$1000**
Add **–TS** Suffix to GRMB Workstation Part # for **17" Touch Screen (SAW)**.....**$1000**

NEMA 4/12 Rack-Mount CRT Monitors • Flush Rack-Mount

#**GRR 5015** 15" SVGA Color CRT Rack-Mt Monitor (NEMA 4).....**$1595**
#**GRR 5017** 17" SVGA Color CRT Rack-Mt Monitor (NEMA 4).....**$2395**

Add **–TC** Suffix to GRR Monitor Part Number for **15-17" Touch Screen** (capacitive)...**$1000**
Add **–R18** or **R24** Suffix to GRR Monitor Part Number for **Rack Mt. Slide Rails** available in 18" (**R18**) and 24" (**R24**) depth. Recommended to support weight of GRR monitor..**$85**

High-Performance Video Graphics Cards

#**GRI 03010** ISA-bus SVGA Graphics Adapter with 1MB VRAM.....**$75**
#**GRI 04020** PCI-bus SVGA Graphics Adapter with 2MB VRAM.....**$95**
#**GRI 04140** PCI-Bus SVGA Accelerator & Video Card with 4MB **$195**
#**GRI 04240** PCI-Bus High-Perf. SVGA Accelerator with 4MB.....**$295**
#**GRI 04244** 4MB Upgrade for GRI 04240 (adds 4MB VRAM; max. 16MB total)..**$149**

***IMPORTANT:** Passive-Backplane Units Require an All-in-One CPU Card (pp. 36-38).

Quantity Discounts: 1-4/List 5-9/5% 10-24/10% 25-49/15%

Quantities of a Single Item Per Shipment – Call for Details

CyberResearch High-Performance Rack-Mount PCs Ideal for Engineering and Scientific Applications

VRK Rack-Mount PCs Include a Color SVGA Monitor & a Built-in Keyboard

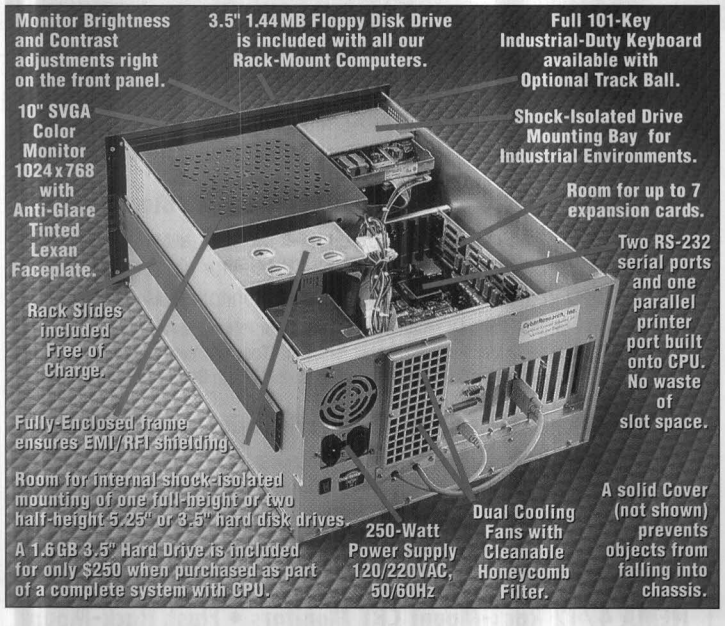
FOD#2044

Keyboard on VTK models comes with a built-in Track Ball

Built-In Keyboard can be recessed behind hinged panel when not in use

VTK & VRK Series High Performance Rack-Mount PC Systems include:

- A choice of **VTK, VTKP, VRK, or VRKP** models with **built-in Keyboard, optional Trackball,** & built-in **10" Color SVGA Monitor** (1024 x 768). Includes PCI or ISA SVGA Adapter w/1 MB DRAM.
- **A choice of Pentium or '486 motherboards** with 2 ISA slots, 3 PCI slots, & 1 slot usable for PCI or ISA, for a total of 6 usable expansion slots, or an optional **8-slot** ISA-bus **passive backplane** with room for full-height/full-length adapter cards. One slot is required for the display adapter.
- ***3.5" 1.44 MB Floppy Disk Drive is included with unit.*** Room for **three horizontal 5.25"** drives (front-accessible), plus an internal bracket can hold 2 standard 5.25" hard drives or devices.
- **Standard EIA 19" Rack-Mountable Chassis** is 19" **W**ide at Flanges; only 10.5" (6 Rack Units) **H**igh, 25" **D**eep (483 **W** x 266 **H** x 635 **D** mm). Enclosures w/o CPU, MB, or PB available on special-order basis.
- **250-Watt Power Supply, Dual-Fan Cooling System, Telescopic Slide Rails, Internal Speaker, Front Panel Reset Switch, Key Switch, LED Indicator Lights** — see below.



Each CyberResearch VRK and VTK-series Rack-Mount PC System includes:

- A Pentium or '486-based Motherboard/CPU with 32MB (Pentium) or 16MB ('486 models) of RAM, expandable to 256/128MB or more.
- MS-DOS Software
- Rugged Telescopic Slide Rails Included
- Two Serial Ports & One Parallel (Printer) Port
- SVGA Video Display Adapter Card *(Includes 1 MB Video RAM, installs in PCI Bus)*
- Glare-Resistant Lexan faceplate
- IDE Disk Controller for 2 hard disk & 2 floppy drives. (Intel's Triton chipset on Pentium Models)
- A 1.44 MB 3.5" Floppy Disk Drive. *(Specify if a 1.2 MB 5.25" Floppy is preferred.)*

Each CyberResearch VRKP and VTKP Passive Backplane PC System includes:

- A basic chassis with a choice of either ISA or PCI/ISA Passive Backplanes, each with room for full-height, full-length plug-in adapter cards.

  Note: Passive Backplane Units require an All-in-One CPU card (not included in price). See selection on pages 36-38.
- SVGA Video Display Adapter Card, with a full 1 MB of Video Ram, *(ISA or PCI-bus version, to match backplane, for highest performance.)*
- A 1.44 MB 3.5" Floppy Disk Drive. Note that a 1.2 MB 5.25" Floppy Drive can be substituted.

A hot-swappable removable hard drive can be installed with ease using our DataPak™ removable hard drive modules on page 43.

Ordering Information: ***For more CPU choices see charts on pages 34-38.***

VRK Rack-Mount Computers with 10" SVGA Color Monitor and Built-In Industrial Duty Rack-Mount Keyboard

#**VRKP 800**	Passive Backplane Unit w/8 ISA Slots	$3395
#**VRKP 530P**	Passive Backplane Unit w/5 ISA Slots & 3 PCI Slots	$3495
#**VRK MR**	Motherboard-Ready Unit (see pg. 34 for motherboards)	$3300
#**VRK 486-133P**	133 MHz AMD486DX/5-133, PCI-bus **w/16MB**	$3845
#**VRK PENT-100P**	100 MHz Intel® Pentium, PCI-bus **w/32MB**	$3945
#**VRK PENT-200P**	200 MHz Intel® Pentium, PCI-bus **w/32MB**	$4195
#**VRK PMX-233**	233 MHz Intel® Pentium **MMX**, PCI-bus **w/32MB**	$4495
#**VRK PRO-200**	200 MHz Intel® Pentium **Pro**, PCI-bus **w/32MB**	$4695
#**VRK PR2-200**	**Dual** 200 MHz Pentium **Pro**, PCI-bus **w/32MB**	$5695
#**VRK PII-233**	233 MHz Intel® Pentium **II**, PCI-bus **w/32MB**	$4695
#**VRK PII-300**	300 MHz Intel® Pentium **II**, PCI-bus **w/32MB**	$5395
#**VRK PII2-300**	**Dual** 300 MHz Pentium **II**, PCI-bus **w/32MB**	$7095

VTK Rack-Mount Computers with 10" SVGA Color Monitor and Built-In Keyboard with Track Ball (See 1410 Keybd Photo on pg 41)

#**VTK xxx-xxx** *Available in same processor models as* ***VRK*** ....add $150

#**VTKP 800**	Passive Backplane Unit w/8 ISA Slots	$3545
#**VTKP 530P**	Passive Backplane Unit w/5 ISA Slots & 3 PCI Slots	$3645
#**VTK MR**	Motherboard-Ready Unit (see pg. 34 for motherboards)	$3450

Popular Optional Accessories

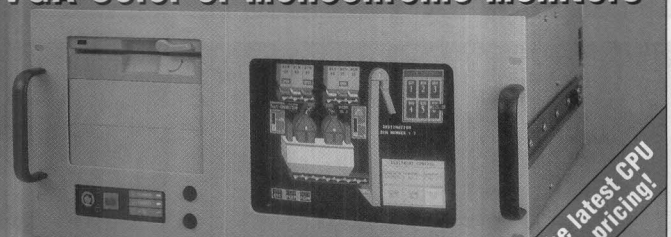
		Was	Now!
#**SIMM 16MB**	16MB RAM (adds 16MB of RAM to a PC system)	$100	$60
#**SIMM 32MB**	32MB RAM (adds 32MB of RAM to a PC system)	$200	$100
#**MSI 21000C**	1.6 GB (1600 MB) IDE Hard Drive (price w/system only)		$250
#**MSI CDI**	5.25" CD-ROM Drive, IDE (24x Speed, minimum)		$100
#**SRP IBR12**	Isobar Rack-Mount 12-Outlet Surge Suppressor		$149
#**MSD W31R**	Windows 3.11 (when purchased with a system – save $50)		$99
#**MSD W95R**	Windows 95 (when purchased with a system – save $50)		$199
#**MSD WNT**	Windows NT Latest Version on CD (CD-ROM Drive required)		$395

Note: See optional accessories starting on pg. 40, including: hard disk drives, printers, rack-mount surge protectors, rack-mount keyboards, UPSs, expansion chassis, etc.

Full Selection of Intel Pentium MMX, Pentium PRO, & Pentium II CPUs Available NOW – see page 34, or call for assistance.

CyberResearch Assistance: Toll-Free 1-800-341-2525 (USA) Tel: 203-483-8815 Fax: 203-483-9024
Applications Engineers: Mon-Fri, 9 AM-5 PM U.S. Eastern Time • **Internet Website:** http://www.cyberresearch.com • **Fax-on-Demand System:** 203-483-9966 • **BBS:** 203-488-8949

VRC & MRV Rack-Mount PCs with SVGA Color or Monochrome Monitors



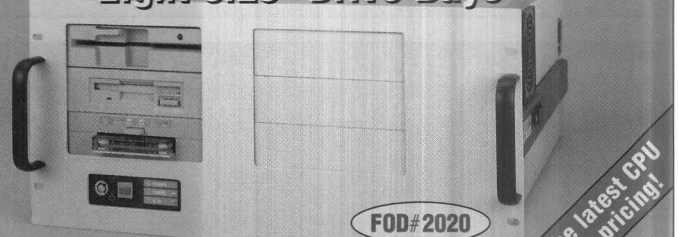
VRC PENT-200P: $2595
Chassis Only: $1700
FOD#2022

Call for the latest CPU & memory pricing!

VRC, VPB, MRV & MPB Series Rack-Mount PC Systems include:

- A choice of **VRC & VPB** models with built-in **10" Color SVGA Monitor,** or **MRV & MPB** models w/built-in **9" Monochrome SVGA Monitor.** Includes PCI or ISA SVGA Adapter with 1MB DRAM.
- **A choice of Pentium or '486 motherboards** with 2 ISA slots, 3 PCI slots, & 1 slot usable as ISA or PCI for a total of 6 usable expansion slots, or an optional **8-slot or 14-slot** ISA or PCI-bus **passive backplane** with room for full-height/full-length adapter cards (one slot required for display adapter).
- ***3.5" 1.44MB Floppy Drive is included with unit.*** Room for **three horizontal 5.25"** drives (front accessible), and an internal bracket can hold 2 additional 5.25" hard drives or devices.
- **Standard EIA 19" Rack-Mountable Chassis** is 19" **W**ide at Flanges; only 8.75" (5 Rack Units) **H**igh (with an optional rack-mt. keyboard: 10.5"/6RU/266mm), 23.7" **D**eep (483**W**x222**H**x602**D** mm).
- **250-Watt Power Supply, Dual-Fan Cooling System, Telescopic Slide Rails, Internal Speaker, Front Panel Reset Switch, Key Switch, and LED Indicator Lights** – see below.

RPC: Rack-Mount Computer with Eight 5.25" Drive Bays

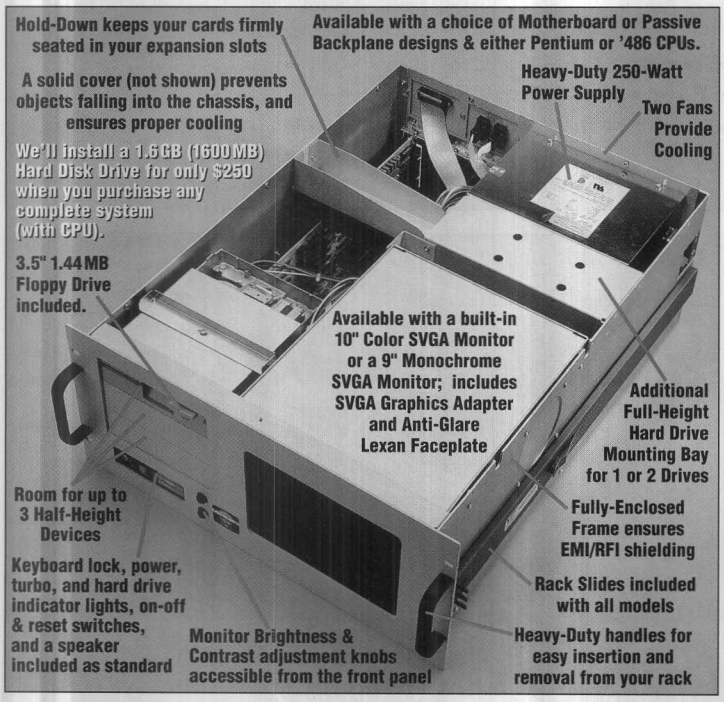


RPC 486-133P: $1145
Chassis Only: $600
FOD#2020

Call for the latest CPU & memory pricing!

RPC & RPB Series Rack-Mount PC Systems include:

- Our **RPC & RPB** models **feature space for up to 8 drives.** ***A 3.5" 1.44MB Floppy Disk Drive is included with each unit.*** Room for **six** half-height 5.25" drives (front-accessible), *plus* an internal bracket which can hold an additional 1 full-height or 2 half-height 5.25" hard drives.
- For use with an optional **externally-mounted monitor only** (graphics adapter card not included).
- **A choice of Pentium or '486 motherboards** with 2 ISA slots, 3 PCI slots, & 1 slot usable as ISA or PCI for a total of 6 usable expansion slots, or an optional **8-slot or 14-slot** ISA or PCI-bus **passive backplane** with room for full-height/full-length adapter cards. Incl. card hold-down clamp.
- **Standard EIA 19" Rack-Mountable Chassis** is 19" **W**ide at Flanges; only 8.75" (5 Rack Units) **H**igh (with optional rack-mt keyboard: 6RU/10.5"/266mm); 23.7" **D**eep (483**W**x222**H**x602**D** mm).
- **250-Watt Power Supply, Dual-Fan Cooling System, Telescopic Slide Rails, Internal Speaker, Front Panel Reset Switch, Key Switch, and LED Indicator Lights** – see below.



Each CyberResearch VRC, MRV, and RPC-series Rack-Mount PC System includes:

- A '486 or Pentium-based Motherboard/CPU with 16MB (486) or 32MB (Pentium models) of RAM, expandable to 128MB.
- MS-DOS Software
- Rugged Telescopic Slide Rails Included
- Two Serial Ports & One Parallel (Printer) Port
- SVGA Video Display Adapter Card *(Includes 1MB Video RAM, installs in PCI Bus)*
- Glare-Resistant Lexan faceplate (except RPC)
- IDE Disk Controller for 2 hard disk & 2 floppy drives. (Intel's Triton chipset on Pentium Models)
- A 1.44MB 3.5" Floppy Disk Drive. *(Specify if a 1.2MB 5.25" Floppy is preferred.)*

Each CyberResearch VPB, MPB, and RPB Passive Backplane PC System includes:

- A basic chassis with a choice of either ISA or PCI/ISA Passive Backplanes, each with room for full-height, full-length plug-in adapter cards.

  Note: Passive Backplane Units require an All-in-One CPU card (not included in price). See selection on pages 36-38.
- SVGA Video Display Adapter Card (except RPB), *(ISA or PCI bus, same bus as the VPB chassis).*
- A 1.44MB 3.5" Floppy Disk Drive.

  A desktop (not rack-mounting) 101-key extended keyboard is included with **VRC, MRV, & RPC** only. See pp. 41 for other keyboard choices.

  A hot-swappable removable hard drive can be installed with ease using our DataPak removable hard drive modules on page 43.

Ordering Information: ***For more CPU choices see charts on pp 34-38***

VRC Rack-Mount Computers w/10" VGA Color Monitor

#VPB 800	Passive Backplane Unit w/8 ISA Slots	**$1795**
#VPB 530P	Passive Backplane Unit w/4 ISA, 1 CPU, & 3 PCI Slots	**$1895**
#VPB 1400P	Passive Backplane Unit w/8 ISA, 2 ISA/CPU, 4 PCI Slots	**$2095**
#VPB 1400	Passive Backplane Unit w/14 ISA Slots	**$1895**
#VRC MR	Motherboard-Ready Unit (see pg. 34 for motherboards)	**$1700**
#VRC 486-133P	133 MHz AMD486DX/5-133, PCI-bus **w/16MB**	**$2245**
#VRC PENT-100P	100 MHz Intel® Pentium, PCI-bus **w/32MB**	**$2345**
#VRC PENT-200P	200 MHz Intel® Pentium, PCI-bus **w/32MB**	**$2595**
#VRC PMX-233	233 MHz Intel® Pentium **MMX**, PCI-bus **w/32MB**	**$2895**
#VRC PRO-200	200 MHz Intel® Pentium **Pro**, PCI-bus **w/32MB**	**$3095**
#VRC PR2-200	**Dual** 200 MHz Pentium **Pro**, PCI-bus **w/32MB**	**$4095**
#VRC PII-233	233 MHz Intel® Pentium **II**, PCI-bus **w/32MB**	**$3095**
#VRC PII-300	300 MHz Intel® Pentium **II**, PCI-bus **w/32MB**	**$3795**
#VRC PII2-300	**Dual** 300 MHz Pentium **II**, PCI-bus **w/32MB**	**$5495**

MRV Rack-Mount Computers w/9" VGA Monochrome

#MRV xxx-xxx	*Available in same processor models as* ***VRC***	deduct **$500**
#MPB 800	Passive Backplane Unit w/8 ISA Slots	**$1295**
#MPB 530P	Passive Backplane Unit w/4 ISA, 1 CPU, & 3 PCI Slots	**$1395**
#MPB 1400	Passive Backplane Unit w/14 ISA Slots	**$1395**
#MRV MR	Motherboard-Ready Unit (see pg. 34 for motherboards)	**$1200**

RPC Rack-Mount Computers with Eight Drive Spaces

#RPC xxx-xxx	*Available in same processor models as* ***VRC***	deduct **$1100**
#RPB 800	Passive Backplane Unit w/8 ISA Slots	**$695**
#RPB 530P	Passive Backplane Unit w/4 ISA, 1 CPU, & 3 PCI Slots	**$795**
#RPB 1400	Passive Backplane Unit w/14 ISA Slots	**$795**
#RPC MR	Motherboard-Ready Unit (see pg. 34 for motherboards)	**$600**

Popular Optional Accessories

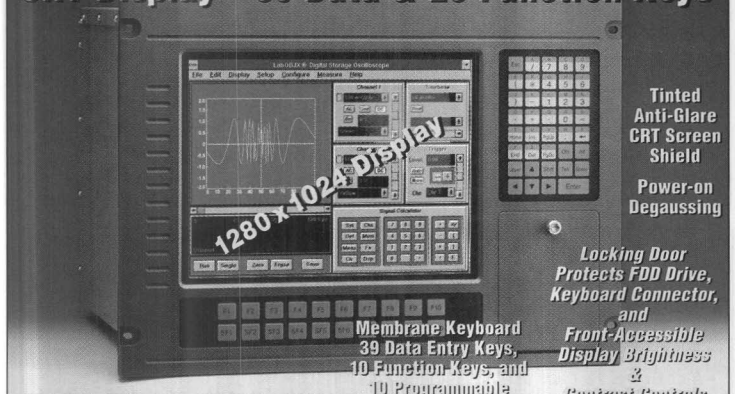
#MSI 21000C	1.6 GB (1600 MB) IDE Hard Drive (price w/system only)	**$250**
#MSI CDI	5.25" CD-ROM Drive, IDE (24x Speed, minimum)	**$100**
#OIX 6010R	Industrial Rack-Mt. Keyboard (purchased w/system)	**$350**
#MSD W95R	Windows 95 (when purchased with a system – save $50)	**$199**

Note: See optional accessories starting on pg. 40, including: hard disk drives, printers, rack-mount surge protectors, rack-mount keyboards, UPSs, expansion chassis, etc.

NEMA 4/12 INDUSTRIAL WORKSTATIONS

CyberResearch Rack-Mount Industrial Workstations — Built Rugged for Use on the Plant Floor

NWD 715: NEMA 4/12 Workstation w/15" CRT Display – 39 Data & 20 Function Keys



PCI-Bus: $2895!
ISA-Bus: $2595!

FOD#2515

15" SVGA Color Monitor / Resolution 1280x1024 (non-interlaced)

Model NWD 715

NWD 715 NEMA 4/12 Workstation w/15" CRT & 8-slot ISA or 7-Slot PCI/ISA Backplane:

- **Built-in Membrane Keyboard** with 39 data entry, 10 function, & 10 programmable macro keys.
- **Display: 15" SVGA Color Monitor,** 1280x1024 res. low-radiation CRT. Dot Pitch: 0.28mm. Horiz. freq: 30-64kHz. Vert. freq: 44-100Hz, non-interlaced. Brightness and contrast controls on front panel. **Includes ISA-bus SVGA Adapter w/1 MB Video RAM.** Touch Screen optional.
- Use **All-in-One Pentium/486 CPU card** with **8-slot ISA-bus Passive Backplane** (total of 6 available slots, 4 full-length & 2 half-size; two slots required for Display Adapter & CPU) or choose **7-slot PCI/ISA-bus Passive Backplane** (4 ISA/1 CPU/2 PCI slots, total of 5 available slots, for 3 full-length & 4 half-size cards (2 PCI & 2 ISA half-size, plus 1 CPU & 2 ISA full-length slots.)
- **250-Watt power supply** – operates on 90-130VAC or 180-260VAC, 47 to 63Hz. **Upgrade to 300W, 350W, 400W, +12VDC, +24VDC, or –48VDC** power supply – see page 40 for details.
- ***NEMA 4 (IP56) & NEMA 12 (IP52) Rated*** **NWD 715 Rack-Mount Chassis** (7 or 8 slots, 15" CRT) **Dimensions:** 19" **W**ide at Flanges, 14" (8RU) **H**igh, 17.7" **D**eep (482**W** x 356**H** x 450**D** mm). Weight: 63.9lbs (29kg) empty.
- **Sealed Aluminum Face Plate** w/Steel Chassis.
- **Works-in-a-Drawer Card Cage** for easy access.
- **Cooling System:** One 32CFM fan (flow-out) on the rear panel for power supply. One 29CFM fan (flow-out) for monitor on rear panel. One 36CFM fan in chassis for plug-in cards.
- **Vibration:** 5 to 17Hz, double-amplitude displacement; 17 to 500Hz: 1.0Gs peak-to-peak.
- **Shock:** (operating) 10G peak accel. (11ms dur.)
- **Locking Door** provides access to floppy drive. ***3.5" 1.44MB Floppy included with unit.*** Internal bracket for one half-height 3.5" HDD. Front/rear access 5-pin DIN keyboard connectors.
- **Operating Temp:** +32 to +122°F (0 to +50°C)
- **Storage Temp:** –4 to +140°F (–20 to +60°C)
- **Relative Humidity:** 5-85%, non-condensing

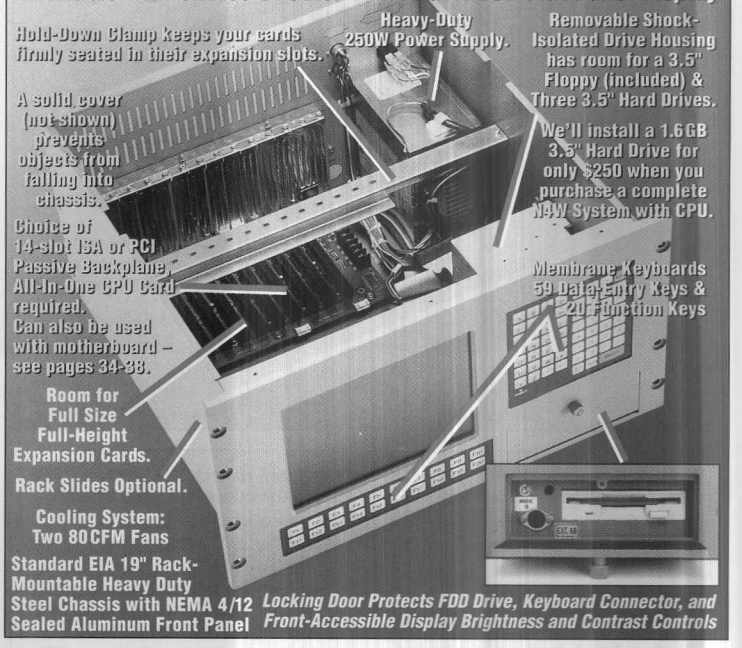
N4W 14T: NEMA 4/12 Workstation with Flat Panel Display + 59 Data & 20 Function Keys

14-Slot Passive Backplane • 250W Power Supply

N4W Series 14-slot NEMA 4/12 Industrial Workstations Feature:

- **Built-in Membrane Keyboards** with 59 data entry and 20 function keys.
- **A choice of two Flat Screen Displays:** 9.4" Color Active Matrix TFT (256 colors) or 9.4" Color STN LCD (16 colors) display. **Price of workstation includes an ISA-bus SVGA Flat-Screen Display Adapter with 1 MB of Video RAM.** Display Resolution: 640 x 480 pixels.
- Use **All-in-One Pentium or 486 CPU card** with a **14-slot ISA-bus** or **PCI/ISA-bus** (8 ISA, 4 PCI, & 2 CPU/ISA slots) **passive backplane** or an optional **Pentium/'486 motherboard** (see page 34 for our motherboard selection chart). One ISA expansion slot is required for the display adapter. Room for full-height/full-length plug-in adapter cards.
- **250-Watt Power Supply** — operates from 90-135VAC or 180-265VAC, at 47 to 63Hz. **Upgrade** to +12V, +24V, –48VDC, 300W, 350W, or 400W power supply – see page 40 for details.

Available with Choice of Color TFT or STN LCD Flat Panel Display



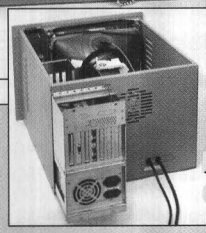
- ***NEMA 4 (IP56) & NEMA 12 (IP52) Rated*** EIA **19" Rack-Mountable Chassis** is 19" **W**ide at Flanges; only 10.5" (6 Rack Units) **H**igh, 18.9" **D**eep (483**W** x 266**H** x 480**D** mm). Wt: 36lbs (16kg).
- **Sealed Aluminum Face Plate** w/Steel Chassis.
- **Vibration:** (operating) 5 to 15Hz: 0.25Gs peak-to-peak; 15 to 500Hz: 2.5Gs peak-to-peak.
- **Locking Door** provides access to Floppy Drive. ***3.5" 1.44MB Floppy included with unit.*** Internal bracket can hold 3 half-height 3.5" HDDs.
- **Operating Temp:** +32 to +112°F (0 to +45°C)
- **Storage Temp:** –4 to +140°F (–20 to +60°C)
- **Relative Humidity:** 5-95% (non-condensing)
- **Altitude:** up to 10,000 feet (3,000 meters)

CyberResearch Assistance: Toll-Free 1-800-341-2525 (USA) Tel: 203-483-8815 Fax: 203-483-9024
Applications Engineers: Mon-Fri, 9AM-5PM U.S. Eastern Time • **Internet Website:** http://www.cyberresearch.com • **Fax-on-Demand System:** 203-483-9966 • **BBS:** 203-488-8949

N4W 15C: NEMA 4/12 Workstation w/15" CRT Display – 51 Data & 24 Function Keys

FOD#2535

PCI-Bus: $3595!
ISA-Bus: $3395!



7-Slot Works-in-a-Drawer Pull-Out Chassis

N4W 15C NEMA 4/12 Workstations Feature:

- **Mem. Keypad:** 51 data entry & 24 function keys
- **Display:** 15" Color SVGA Monitor. **Includes ISA-bus SVGA Adapter w/1 MB Video RAM.** 1280 x 1024, non-interlaced (Touch Screen optional).
- Use **All-in-One Pentium/486 CPU card** with **7-slot ISA-bus Passive Backplane** (total of 5 available full-length slots; two slots required for display adapter & CPU card) or choose **7-slot PCI/ISA-bus Passive Backplane** (3 PCI / 3 ISA / 1 CPU slots, total of 5 available full-length slots).
- **3.5" 1.44 MB Floppy Drive included w/unit.** Internal bracket can hold two 1/2-height 3.5" HDDs.
- **250-Watt power supply** – operates on 90-135VAC or 180-265VAC, 47 to 63Hz. **+12VDC, +24VDC, & –48VDC** Power Supplies are available on a Special-Order basis. System operating temp: 0 to 50°C.
- ***NEMA 4 (IP56) & NEMA 12 (IP52) Rated*** **EIA 19" Rack-Mount Chassis:** Steel Chassis with **Sealed Aluminum Face Plate**. Model **N4W 15C** is 19" **W**ide at Flanges; 14" (8 RU) **H**igh, 20" **D**eep. (483 **W** x 354 **H** x 510 **D** mm). Weight: 82 lbs (37.3 kg), without cards or drives.

Built-in 15" SVGA Color Monitor / 1280 x 1024

A solid Cover (not shown) prevents objects from falling into chassis.

Room for Full Size Full-Height Expansion Cards.

Model N4W 15C

Dual Cooling Fans In Front & Rear

MicroTouch® Capacitive Touch Screen (optional)

Membrane Keyboard 51 Data-Entry Keys & 24 Function Keys

Standard EIA 19" Rack-Mountable Heavy Duty Steel Chassis with NEMA 4/12 Sealed Aluminum Front Panel.

Hold-Down Clamp keeps your cards firmly seated in their expansion slots.

Works-In-a-Drawer Card Cage for easy access.

Heavy-Duty 250 W Power Supply.

Removable Shock-Isolated Drive Housing has room for a 3.5" Floppy (Included) & Two 3.5" Hard Drives.

We'll Install a 1.6 GB Hard Drive for only $250 when purchased as part of a complete N4W System with CPU.

Front & Rear External Keyboard Connectors.

Locking Door Protects FDD Drive, Keyboard Connector, and Front-Accessible Display Brightness and Contrast Controls

N4M 10T: NEMA 4/12 Color Monitor 10.4" TFT LCD Display – Membrane Keypad

FOD#2510

NEMA 4/12 Rack-Mt. Monitor:

- **Built-in Membrane Keypads** with 59 data entry keys and 10 function keys.
- 19" **W**ide at flanges; 10.5" **H**igh (6 Rack Units); 1.93" **D**eep; depth behind panel (**PD**): 1.62". 483 **W** x 266 **H** x 49.2 **D** / 41.2 **PD** mm; 12.3 lbs (5.6 kg).

- **Display** 10.4" Flat-Panel Display: **Color TFT**, 100 nits, 640 x 480, 256 colors (Touch Screen optional). Brightness and contrast adjustments on the front panel. **ISA Flat Panel Display Controller Card & interconnecting 6'/1.8m Round Cable included** (max. length: 20'/6m). Display power supplied from Controller Card. Simultaneous flat panel & CRT display @ 640x480.
- **NEMA 4/12:** Operating Temp: 0 to 50°C. Rel. Humidity: 5 to 95% (non-cond), Alt: 10,000 ft.
- 5-pin DIN Keyboard connector with screw-on dust cover on front. Connectors on rear for: Keyboard (5-pin DIN), Flat Panel Display Card (36-pin centr.), & optional Touchscreen (RS-232).
- **For additional information see FOD#2510**

N4W 8DSP: NEMA 4/12 Workstation w/13.8" Dual Scan LCD & 10-Slot PCI/ISA Backplane

NEW!

Fax-on-Demand: FOD#2508

N4W 8DSP: $3795!
N4W 8TFP: $5795!

Front Access for: 3.5" FDD and 5.25" CD-ROM

N4W 8DSP NEMA 4/12 Workstations Feature:

- **Flat Panel Display:** 13.8" Color DSTN or TFT, High Brightness, 1024x768, 256K colors. **Includes matching PCI SVGA Adapter w/2MB VRAM.**
- Use **All-in-One Pentium/'486 CPU card** w/**10-slot PCI/ISA-bus backplane** (2 slots required for PCI display adapter & CPU card; has 8 full-height/full-length slots available: 3 PCI & 5 ISA).
- **Locking Door** provides access to power switch, brightness & contrast controls; **3.5" 1.44 MB Floppy Drive included w/unit;** has room for a **5.25" Floppy or CD-ROM drive.** An internal bracket can hold one half-height 3.5" Hard Disk. Keyboard connectors on both front & rear of unit.
- **250-Watt Power Supply** – operates on 85-135VAC or 180-265VAC, 47 to 63Hz. **Upgrade to +12V, +24V, or –48VDC** power supply – see pg. 40. **Operating temp:** +32 to +113°F (0 to +45°C).
- ***NEMA 4 (IP56) & NEMA 12 (IP52) Rated*** **EIA 19" Rack-Mount Chassis** has **Sealed Aluminum Face Plate** with Zinc Steel Chassis. 19" **W**ide at Flanges; 14" (8 RU) **H**igh, 10" **D**eep. (483 **W** x 354 **H** x 256 **D** mm); 80 CFM Cooling Fan. Weight: 35 lbs (16 kg), empty.

For More Info via Fax-on-Demand call 203-483-9966 • **Quantity Discounts for 5+ Units**

Ordering Information: ***See PC System Comparison Chart on Page 39***

NEMA 4/12 15" Color CRT Workstations • 7 ISA or 7 PCI/ISA Slots
High Resolution Color CRT 1280x1024 • 59 Data & 24 Function Keys

#**NWD 715** 15" Color CRT Rack-Mt, Passive Backplane w/8 ISA slots..**$2695**
#**NWD 715P** **NWD 715** with PCI/ISA Backplane: 4 ISA / 1 CPU / 2 PCI slots....**$2895**

NEMA 4/12 9.4" TFT LCD Display Workstations • 14 ISA/PCI Slots

#**N4W 14TP** 9.4" Color TFT Rack-Mount PC, 4 **PCI** / 8 ISA / 2 CPU slots..**$3495**
#**N4W 14T** 9.4" Color TFT Rack-Mount PC, 14 **ISA** slots.....**$3295**
#**RRT RSL** Rack Slide Set: 18" Slides + 7" Extender (for 18" to 25" depths)....**$95**

NEMA 4/12 15" Color CRT Workstations • 8 ISA or 7 PCI/ISA Slots

#**N4W 15C** 15" Color CRT Rack-Mt, Passive Backplane w/8 ISA slots..**$3395**
#**N4W 15CP** **N4W 15C** with PCI/ISA Backplane: 3 ISA / 1 CPU / 3 PCI slots..**$3595**

NEMA 4/12 13.8" Color LCD Display Workstations • 10 PCI/ISA Slots

#**N4W 8DSP** 13.8" Color DSTN LCD Rack-Mt, 10 slots, full keybd.....**$3795**
#**N4W 8TFP** **N4W 8DSP** with TFT Active Matrix LCD Display.....**$5795**

NEMA 4/12 10.4" Color TFT LCD Monitor w/Membrane Keypad

#**N4M 10T** 10.4" Color TFT Monitor, full alpha/num keybd, 1.8m cable..**$2595**
#**N4M 10T–6MU** Optional 6-meter Display Cable for N4M 10T.....**$85**

Best Buys in red. Add **–T** Suffix to N4 or NW PC Part# for **Touch Screen**.....**$1000**

IMPORTANT: **Passive-backplane units require an All-in-One CPU Card – see pp. 36-38**

Note: N4 & NW Rack-Mount PCs include a 3.5" 1.44 MB Floppy Drive (FDD) & a Flat Screen or CRT Display Adapter (w/1 MB VRAM). A 3.5" 1.6 GB Hard Drive is included for only $250 when purchased as part of a complete system with CPU. Optional accessories start on page 40: RAM upgrades, hard drives, printers, rack-mount surge protectors, UPSs, etc.

Industrial Rack-Mount PC Chassis

- ***NEMA 4/12* Panel-Mount PC with 56-Key Membrane Keyboard**; 12.60"**W**ide, 13.47"**H**igh, 3.69"**D**eep w/bezel (320x342x93.7mm); 3.38"**D**epth behind Panel (85.7mm). Wt: 14.3lbs (6.5kg). Case made from painted aluminum alloy. **Cooling via a 30CFM Fan** with filter.
- **56-Key Sealed Membrane Keyboard** provides full data-entry functions; has 10 function keys.
- **The PKR 10 is a complete panel-mount computer system with display and keyboard.** Each unit comes with **a 1.6GB Hard Drive, 32MB** (Pentium) **or 16MB** (486) **of RAM, a 133MHz Pentium or '486 Microprocessor, & MS-DOS software.**
- **I/O ports**: 3 serial ports (two RS-232 and one selectable as RS-232/422/485), a parallel (printer) port, an external floppy drive connector, a 5-pin DIN keyboard connector, a PS/2 mouse port, & a 10Base-T port. **#PRF 35144** Floppy Drive Kit – 3.5" 1.44MB Floppy Drive with Cable & Mounting Bracket.....**$195**
- **Color Flat Screen 640 x 480 Display: 10.4" Active Matrix TFT** display, 256K colors, 200cd/m² (nits), 90° viewing angle. **SVGA CRT/Flat Screen Controller included** with 1MB of video RAM – supports simultaneous remote external CRT at 640 x 480.
- Optional **Touch Screen** (factory upgrade): **#PKR TRU** Analog Resistive Touch Screen.....**$700**
- **55-Watt power supply**: 85-265VAC, at 47 to 63Hz or 360-440Hz. Optional **DC Power Supplies:** **#PSR55 4512** Upgrade PKR to +12V (+9.5 to +18VDC) input, 45W Power Supply.....**$100** **#PSR55 5524** Upgrade PKR to +24V (+16 to +32VDC) input, 55W Power Supply.....**$100**
- **Operating Temp:** +32 to +122°F (0 to +50°C) • **Storage Temp:** –4 to +140°F (–20 to +60°C) **Relative Humidity:** 5 to 95%, non-condensing • **Shock:** 10Gs peak acceleration, 11ms duration **Vibration:** (operating) 5 to 17Hz: 0.1" double-amplitude displacement; 17 to 500Hz: 1.5Gs peak-to-peak.

- ***NEMA 4/12* Panel-Mount PC with 5-Slot PCI Backplane**; 16.54"**W**ide, 11.81"**H**igh, 8.39"**D**eep w/bezel (420x300x213mm); 8.07"**D**epth behind Panel (205mm). Weight: 27lbs (12.3kg).

- **250-Watt power supply**: 90-135 or 180-265VAC, at 47 to 63Hz. **Upgrade to** 350W, 400W, +12VDC, +24VDC, or –48VDC power supply – see pg. 40. One 30CFM **Cooling Fan** w/removable filter.
- **5-slot PCI/ISA-bus passive backplane for full-length cards.** Two slots are used by the CPU card & PCI flat panel display adapter, leaving 3 expansion slots (1 PCI + 2 ISA slots) available.
- **Color Flat Screen 1024 x 768 Display:** choice of either a **13.8" Active Matrix TFT** display (256K colors, 200cd/m², 90° viewing angle) **or Dual Scan LCD** display (64K colors, 150cd/m², 60° viewing angle). **PCI SVGA CRT/Flat Screen Controller included** with 1MB of video RAM – supports simultaneous remote external CRT at 1024 x 768.
- Optional **Touch Screen** (factory upgrade): **#NRB TRU** Analog Resistive Touch Screen.....**$1000**
- **Each unit comes supplied with a 24x CD-ROM Drive *and* a 3.5" 1.44MB Floppy Drive.** In addition, there is mounting space for one internal 3.5" hard disk drive – see page 43 for hard drives.
- Use with any of our **All-in-One Pentium or '486 CPU cards** (see pages 36-38).
- **Operating Temp – *NRB 5TP:*** +32 to +122°F (0 to +50°C) ***NRB 5DP:*** +32 to +104°F (0 to +40°C) **Storage Temp:** –4 to +140°F (–20 to +60°C) **Relative Humidity:** 5 to 95%, non-condensing. **Vibration:** (operating) 5 to 17Hz: 0.1" double-amplitude displacement; 17 to 500Hz: 1.5Gs peak-to-peak.

NWC 9C/8T NEMA 4/12 6RU Workstations w/Choice of 10" CRT or TFT LCD Flat Panel Display

Need Info? Fax-on-Demand: **FOD#2309**

8T/TP: Only 12.1" Deep!

9C/9CP Only 16.1" D

NWC 9CP/8TP PCI-Bus: $2995-3095
NWC 9C/8T ISA-Bus: $2895-2995
NWC 8TMR Motherboard-Ready: $2900

NWC 9C and NWC 8T NEMA 4/12 Rack/Panel-Mount Industrial Workstations Feature:

- **Display: NWC 9C:** 10" Color CRT (resolution: 1024x768); brightness & contrast on front panel. **NWC 8T:** 10.4" Flat-Panel Display: Color TFT LCD (640x480), High-bright (256K colors). Resistive Touch Screen optional (**NWC 8T only**). Comes with **ISA Flat Screen SVGA Adapter, 1MB VRAM.**
- **NWC 9C** (Color CRT) **10-slot ISA-bus backplane** (3 half-size slots) or **9-slot PCI/ISA-bus** (5ISA/1CPU/3PCI) passive backplane for full-size cards. **NWC 8T** (Color TFT) available with **8-slot ISA** or **8-slot PCI/ISA-bus** (3ISA/2CPU/3PCI) passive backplane for full-size cards.
- **NEMA 4/12:** 19" **W**ide at Flanges; only 10.5" High (6 Rack Units); **NWC 9C** (Color CRT) is 16.1" **D**eep, **NWC 8T** (Color TFT) is 12.1" **D**eep; 483mm**W**x266mm**H**x410mm**D** (**9C**) or 307mm**D** (**8T**). **Membrane Keypad:** 60 data entry keys + 10 function keys & 10 prog. macro keys. Weights: **9C/8T** 53/33lbs.
- **NWC 9C/8T 200/250-Watt power supply:** 90-130/180-264VAC, Auto-Ranging, Fan cooling.
- Use **All-in-One Pentium or '486 CPU card. Front-accessible *3.5" 1.44MB Floppy Drive included.*** Room for **one internal 3.5" HDD.** LEDs for Power On, Keybd. Lock, & Hard Drive. Front & rear 5-pin DIN keybd. connectors (**9C** has screw-on dust cover for kbd. conn.), plus power & reset switches on front. **Operating Temp:** +32 to +122°F (0 to 50°C), **Rel. Hum:** 5 to 95% (non-cond.)

N4W 8T1 NEMA 4/12 9.8" Deep Workstations

N4W 8T1 NEMA 4/12 Rack/Panel-Mt. PC

- **Display** 10.4" Flat-Panel Display: Color TFT LCD, 640x480. Resistive Touch Screen optional. Brightness & contrast adjustment on front panel. Price includes ISA SVGA controller card. (1 slot).
- **Membrane Keyboards** with 59 data entry and 20 function keys.

- ***NEMA 4 (IP56) & NEMA 12 (IP52) Rated*** **EIA 19" Rack-Mountable Chassis** is 19" **W**ide at Flanges; only 10.5" **H**igh (6 Rack Units), 9.8" **D**eep (483**W**x266**H**x248**D** mm). Weight: 30 lbs (13kg).
- Use **All-in-One Pentium or '486 CPU card** in either an **8-slot ISA-bus** or a **PCI/ISA-bus** (3 ISA, 3 PCI, & 2 CPU/ISA slots) **passive backplane** — see pp. 36-38 for CPU cards.
- **200W power supply:** 90-135/180-265VAC, auto-ranging. Fan cooling. **Upgrade to** 300W, 350W, 400W, +12VDC, +24VDC, or –48VDC power supply – see pg. 40 for details.
- **Locking Door** protects access to floppy drive. ***3.5" 1.44MB Floppy included.*** Internal Bracket for one half-height 3.5" Hard Drive.
- **Operating Temp:** 0 to 45°C. **Storage Temp:** –20 to +60°C. Rel. Hum: 5 to 95% (non-cond.)

N4W AX6260 NEMA 4/12 Workstation

N4W AX6260 NEMA 4/12 Rack/Panel-Mt. PC

- **Display:** 9" flat-panel solid-state thin-film Electro-Luminescent (EL) matrix display. Resolution: 640x480; **w/ISA EL Display Adapter.**

- **NEMA 4/12:** Rugged enclosure suitable for factory floor. Front-accessible keyboard connector with screw-on dust cover.
- **8-slot ISA-bus passive backplane** for **full-size** cards. Use w/All-in-One CPUs: pp. 36-38.
- 19" **W**ide at Flanges; Only 10.5" High (6 Rack Units); 8.8" **D**eep (483**W**x266**H**x224**D** mm). **Membrane Keypad.** Approx. 29lbs (13kg).
- **150-Watt power supply:** accepts 90-130V or 180-264VAC, Auto-Ranging, Fan cooling.
- ***3.5" 1.44MB Floppy Disk Drive included.*** An internal bracket for 1 half-height 3.5" HDD.
- **Operating Temp:** 0 to +55°C; **Storage Temp:** –40 to +75°C. Rel. Hum: 5 to 95% (non-cond).

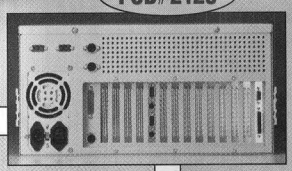
CyberResearch Assistance: Toll-Free 1-800-341-2525 (USA) ☎ Tel: 203-483-8815 Fax: 203-483-9024
Applications Engineers: Mon-Fri, 9AM-5PM U.S. Eastern Time • **Internet Website:** http://www.cyberresearch.com • **Fax-on-Demand System:** 203-483-9966 • **BBS:** 203-488-8949

RWL 14: 14-Slot Rack-Mt PC w/TFT
Flat-Panel Display & Front-Access Drive Bay

PCI-Bus: $3495
ISA-Bus: $3295

Only 8.75" High
Three 3.5" + One 5.25" Drive Bays

FOD#2120



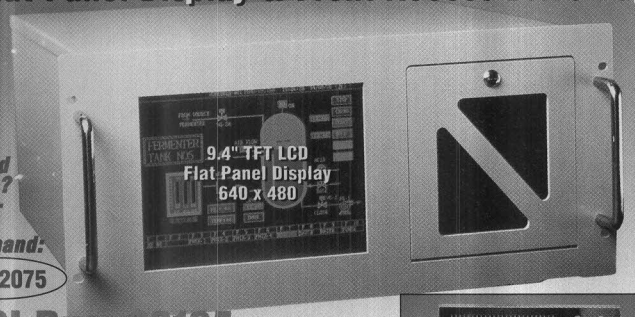
RWL Series 14-slot Industrial Duty Compact Rack-Mount PCs Feature:

- **Built-in Membrane Keyboard** with 48 data entry and 6 function keys
- **Flat Screen Display:** 10.4" Color Active Matrix TFT. **Price includes an ISA-bus SVGA Flat Screen Controller with 1 MB of Video RAM.** Display Resolution: 640 x 480 pixels.
- Use **All-in-One Pentium or '486 CPU card** (pp. 36-38) and a **14-slot ISA-bus** or **PCI/ISA-bus** (8 ISA, 4-PCI, & 2-PCI/ISA CPU slots) **passive backplane.** One ISA slot is required for the display adapter. Room for full-height, full-length & half-size expansion cards.
- **14-slot ISA or PCI/ISA-bus passive backplane** for half & full-length cards; with hold-down clamp.
- 19" **W**ide at flanges; only 8.75" (5 RU) **H**igh, 17.5" **D**eep. (483**W** x 222**H** x 443**D** mm). Weight 16kg/36lbs.
- **Front Access Drive Bay:** Can hold one half-height 5.25" and three half-height 3.5" drives. ***A 3.5" 1.44MB Floppy is included with unit.*** **Locking Dustproof Security Door** provides access to floppy drive and keyboard connector.
- **250-Watt Power Supply** — operates from 90-135VAC or 180-265VAC, at 47 to 63Hz. 350W, 400W, +12VDC, +24VDC, or –48VDC power supplies available – see page 40 for details.
- **Operating Temp:** +32 to +122°F (0 to +50°C) **Relative Humidity:** 10-90%, non-condensing.

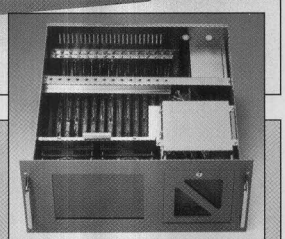
N1R 14T: 14-Slot Rack-Mt PC w/TFT
Flat Panel Display & Front-Access Drive Bay

Need Info? Fax-on-Demand:

FOD#2075



PCI-Bus: $3195
ISA-Bus: $2995

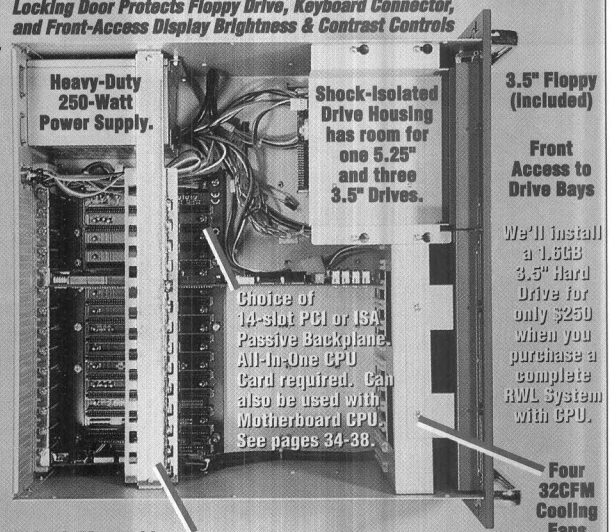


N1R Series 14-slot NEMA 1 Rack-Mount PCs Feature:

- **Flat-Panel Display:** 9.4" color TFT LCD (4096 colors). **Includes an ISA Flat-Screen SVGA Video Adapter with 1MB Video RAM.** Resolution 640 x 480 pixels.
- Use **All-in-One Pentium or 486 CPU card** and **14-slot ISA-bus** or **PCI/ISA-bus passive backplane** (8 ISA, 4 PCI, & 2 PCI/ISA CPU slots) or optional **Pentium/486 motherboards** with 3 ISA slots, 3 PCI slots, and 1 PCI/ISA slot (for a total of 7 usable expansion slots.) One ISA slot is required for the display adapter. Room for full-height, full-length and half-size expansion cards.
- **14-slot ISA or PCI/ISA-bus passive backplane** for half & full-length cards; with hold-down clamp.
- 19" **W**ide at flanges, only 8.75" (5 RU) **H**igh, 18.6" **D**eep (483**W** x 222**H** x 473**D** mm). Weight: 36lbs (16kg).
- **250-Watt power supply** – operates from 90-135VAC or 180-265VAC, at 47 to 63Hz. **Upgrade** to 350W, 400W, +12VDC, +24VDC, or –48VDC power supply – see page 40 for details.
- **Front Access Drive Bay:** A removable drive mounting bay can hold 4 half-height 5.25" drives and 1 half-height 3.5" hard or floppy drive. ***3.5" 1.44MB Floppy Drive included with unit.***
- **Locking Security Door** protects access to floppy disk drive, keyboard connector, and monitor brightness & contrast controls. Keyboard connectors located on both front and rear of unit.
- **Operating Temp:** +32 to +112°F (0 to +45°C) • **Relative Humidity:** 5-95%, non-condensing **Vibration:** (operating) 5 to 15Hz: 0.25Gs peak-to-peak; 15 to 500Hz: 2.5Gs peak-to-peak.

RWL 14 NEMA 1 Compact Workstation

Locking Door Protects Floppy Drive, Keyboard Connector, and Front-Access Display Brightness & Contrast Controls



Ordering Information: ***See PC System Comparison Chart on page 39***

NEMA 4/12 PC w/10" TFT, Keybd, '486 or Pentium, RAM, & HDD

#PKR 10486 10.4" TFT Workst. w/Kbd, 486-133MHz, 1.6GB HDD, 16MB.....**$3995**
#PKR 10PEN 10.4" TFT Workst. w/Kbd, Pentium-133MHz, 1.6GB HDD, 32MB..**$4395**

NEMA 1 Passive Backplane Rack-Mt Workstations • 14 ISA/PCI Slots
10.4" TFT LCD • Membrane Keyboard • Front-Access Drive Bays

#RWL 14P 10.4" Color TFT LCD Rack-Mt PC, 4 **PCI**/8 ISA/2 CPU slots..**$3495**
#RWL 14 10.4" Color TFT LCD Rack-Mt PC, 14 **ISA** slots **$3295**
#RWL MR 10.4" Color TFT Rack-Mt PC, **Motherboard-Ready** (pg 34)..**$3200**
#RNA RS-xx Rack Slides (**xx** – specify rack depth in inches; call for availability)..**$85**

NEMA 1 Passive Backplane Rack-Mount PCs • 14 ISA/PCI Slots

#N1R 14TP 9.4" Color TFT Rack-Mount PC, 4 **PCI**/8 ISA/2 CPU Slots ..**$3195**
#N1R 14T 9.4" Color TFT Rack-Mount PC, 14 **ISA** Slots.....**$2995**
#RRT RSL Rack Slide Set: 18" Slides + 7" Extender (for 18" to 25" depths)....**$95**

NEMA 4/12 13.8" Color XVGA Panel-Mt. PC • 5 PCI/ISA Slots

#NRB 5TP 13.8" Color TFT Panel-Mt. PC w/24x CD-ROM & 5 slots....**$5595**
#NRB 5DP 13.8" Color Dual Scan Panel-Mt. w/24x CD-ROM & 5 slots..**$3595**

NEMA 4/12 10" Color SVGA Workstations • 8/9 PCI/ISA Slots

#NWC 9CP 10" Color CRT Rk-Mt PC, 5 ISA/1 CPU/3 PCI slots (No Touch Scrn)...**$2995**
#NWC 9C 10" Color CRT Rk-Mt PC, **10 ISA** slots (No Touch Screen) **$2895**
#NWC 8TP 10.4" Color TFT Rack-Mount PC, 4 ISA/1 CPU/3 PCI slots.....**$3095**
#NWC 8T 10.4" Color TFT Rack-Mount PC, **8 ISA** slots **$2995**
#NWC 8TMR 10.4" Color TFT Rack-Mt PC, **Motherboard-Ready**, see pg 34..**$2900**

NEMA 4/12 Passive Backplane Compact Workstations • 8 ISA Slots

#N4W 8T1P 10.4" Color TFT Rack-Mt. PC, 3 **PCI**/3 ISA/2 CPU slots.....**$3295**
#N4W 8T1 10.4" Color TFT Rack-Mt. PC, 8 **ISA** slots.....**$3195**

NEMA 4/12 Passive Backplane 9" EL Workstations • 7 ISA Slots

#N4W AX6260 9" EL Rack-Mt PC, 7 ISA Slots (No Touch Screen).....**$4495**

Add **–T** suffix to RWL, N1R, NRB, NWC 8T, & N4W PC part# for **optional Touch Screen**..**$700**

#MSI 21000C 1.6GB (1600MB) IDE Hard Drive (price w/system only)...**$250**

#Best Buy items in red. **See chart on pp. 34 & 39 for motherboard-ready units.**

IMPORTANT: **Passive-backplane units require an All-in-One CPU Card – see pp. 36-38**

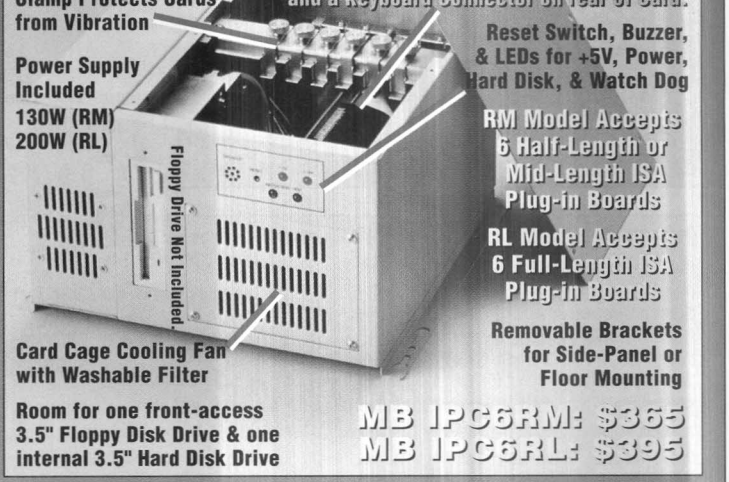
Note: Our RWL, N1R, NRB, NWC, & N4W PCs include a 3.5" 1.44MB Floppy Drive & a flat-screen or CRT Display Adapter (w/1MB VRAM). A 3.5" 1.6GB Hard Drive is included for only $250 when purchased as part of a complete system with CPU. Optional accessories start on page 40: RAM upgrades, hard drives, printers, rack-mount surge protectors, UPSs, etc.

CyberResearch MicroBox™ Industrial PCs: Compact Passive-Backplane PC Chassis & Node Controllers

6 Full-Size ISA or PCI/ISA Slots MicroBox Industrial PC Chassis

MB IPC6N: $395
MB IPC6NP: $450

6 Mid-Size or Full-Size ISA Slots MicroBox Industrial PC Chassis



MB IPC6RM: $365
MB IPC6RL: $395

IPC-Series MicroBox Chassis: 3, 4, 5, 6, 7, 8, 10, & 11-Slot ISA & PCI/ISA-Bus Passive-Backplane Industrial PCs

The low cost, compact size, and rugged construction of the MicroBox™ Industrial PC Chassis makes it an ideal choice for use in factory floor and embedded applications where space is limited. These industrial node chassis are ideally suited for system integrators as well as end-users who require a small, rugged industrial PC system which will stand on a table top, or can be wall-mounted. Our MicroBox PCs feature heavy-duty steel construction, and can be mounted almost anywhere — **on a wall, under a workbench, in a vending machine, or even in an automobile**.

MicroBox PC Enclosures:

- We offer a wide selection of MicroBox enclosures, including the **IPC3T** (3 half-length slots); the **IPC6N** (6 full-length slots); the **IPC7T** (7 full-length slots); and our **IPC80** (with 8 full-length slots). An **ISA-Bus Passive Backplane Chassis** with PC/AT-style slots is supplied as standard. A **PCI/ISA-Bus** backplane is available as an option with many models.
- The MicroBox's passive backplane is made up of a 4-layer PC board with separate ground and power planes for improved noise immunity, and lower power supply impedance. The backplane accepts both half-size and full-length/full-height plug-in adapter cards. (Some chassis accept half-size cards only.)

Internal Features:

- Drive receptacle has built-in vibration damping. Most models **include room for one externally-accessible 3.5" floppy drive and internally-mounted IDE hard disk drives.** See the charts on pp. 23-25 for quantity of disk bays in each model.
- Cooling provided by vents on sides along the IPC3S, 4, & 6S chassis surface (chassis runs in silence). Other models include a cooling fan with filter (see charts). The combination of a filter and positive internal air pressure protects components from contaminants. Filters may be easily removed and cleaned.
- A special hold-down clamp keeps your plug-in expansion cards in place while protecting them from shock & vibration (most models).
- Removable mounting brackets built onto most MicroBox models facilitate wall, side-panel, or surface mounting of the chassis.

System Configuration:

- CyberResearch "All-in-One" CPU cards: a large selection is available for use with our MicroBox Chassis — see pages 36-38.
- With installation of an "All-in-One" CPU card and a RAM/ROM disk card, the system can be configured to operate as a diskless control unit, with or without a keyboard or monitor, for installation in harsh environments. RAM/ROM disk emulates 1 or 2 floppy drives. Each drive can be configured as either A: or B:.
- If you need a monitor which requires very little space, our newest flat-screen VGA monitors (pp. 12-13) are just 2" to 2.5" thick, in 10.4", 12.1", and 14" models. We also offer rack-mount monitors (pp. 14-15), industrial keyboards, compact keyboards, (pg. 41) and DC power supplies (+12V, +24V, & –48V, page 40).
- See charts on pp. 23-25 for performance specifications. Net weights in the charts are without a CPU, floppy, or hard drive.
- Most models include a Power Supply – see the charts pp. 23-25. Models with no power supply require an external power supply.
- Most models include a front panel reset switch, and an LED power indicator.

6, 8, 11, & 14-Slot Industrial Card Cage Chassis:

Our low-profile MicroBox Industrial Card Cage PC Chassis have been designed for use in embedded applications where space is limited. They are ideal for horizontal or vertical mounting in cabinets or racks.

MicroBox Card Cages feature:

- Heavy-duty all-metal open frame construction with fans for maximum cooling.
- 6, 8, 11, or 14 slots (4, 10, & 12-slot versions available by Special Order).
- Power Supply optional: see power supplies on pg. 40.
- Please call for detailed specifications. See photos on pages 4A and 25.

QUANTITY DISCOUNTS: 1-4/LIST 5-9/5% 10-24/10% 25-49/15% **Quantities of a Single Item Per Shipment – Call for Details**

CyberResearch Assistance: Toll-Free 1-800-341-2525 (USA) Tel: 203-483-8815 Fax: 203-483-9024
Applications Engineers: Mon-Fri, 9 AM-5 PM U.S. Eastern Time • **Internet Website:** http://www.cyberresearch.com • **Fax-on-Demand System:** 203-483-9966 • **BBS:** 203-488-8949

Tower Chassis MicroBox PCs with Built-in Power Supply

See our All-in-One CPU Cards on pp. 36-38

3-Slot MB IPC3T

$275

Use with All-In-One™ Half-Size CPU Card pages 36-38

BE$T VALUE!

3 Half-Length Boards
40W Power Supply

MB IPC3T

Mounting Space for 2.5" HDD

FOD#2329

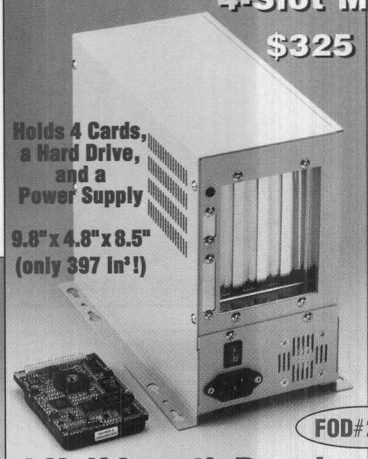
Removable Brackets for Floor or Side-Panel Mounting

4-Slot MB IPC4T

$325

Holds 4 Cards, a Hard Drive, and a Power Supply

9.8"x 4.8"x 8.5" (only 397 In³!)



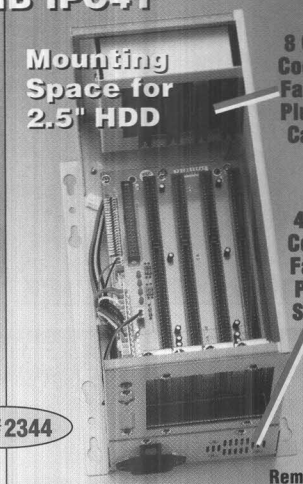
FOD#2344

4 Half-Length Boards
60W Power Supply

Mounting Space for 2.5" HDD

8 CFM Cooling Fan for Plug-In Cards

4 CFM Cooling Fan for Power Supply



Top View

Removable Mounting Brackets

7-Slot MB IPC7TP

$375
$425

FOD#2337

Add 1 Floppy (3.5") & 1 HDD (3.5")

Cooling Fans for Plug-in Cards & Power Supply

7 Half or Full-Size Brds
2 ISA-2 CPU-3 PCI • 130W

8-Slot MB 8T

$195
$295
$395

FOD#2328

Option: Mother-Board Ready

Option: 8 ISA Slots

Option: 3 ISA 2 CPU 3 PCI Slots

Optional Mother-Boards page 34

Tower w/ Room for
8 Full-Size Boards • 200W

7-Slot MB IPC7X/7XP

FOD#2347

Optional +12V, +24V or −48VDC

Holds 1 FDD 3.5" 1 HDD 3.5", & 1 CD-ROM 5.25"

Drives not included

250W Power Supply

7-Slot MB IPC7XP

$685
$785

Optional 7 ISA Slots

7 Half or Full-Size Brds
3 ISA-1 CPU-3 PCI • 250W

Tower Chassis MicroBox Industrial PCs

Requires an All-in-One CPU Card (pp. 36-38) to use as a Stand-Alone PC — Fax-on-Demand: FOD#2300

Part Number	Slots	FOD#	Card Size	Type	Power Supply	Disk Drive Bays	Cooling	Oper. Temp	Rel. Humidity	Mounting Dim. (WxHxD)	Weight	Price
#MB IPC3T	3 Slots	2329	Short	ISA	40 Watts	1 HDD (2.5")	Vents	0 to 50°C	5% to 95%	3.5x7.6x8.6" 87x192x218mm	5.5 lb.	$275
#MB IPC4T	4 Slots	2344	Short	ISA	60 Watts	1 HDD (2.5")	2 Fans	0 to 50°C	5% to 95%	4.8x8.5x9.8" 122x215x248mm	8.4 lb.	$325
#MB IPC4TF	4 Slots	2342	Short	ISA	60 Watts	1 Front-Access 3.5" FDD/HDD	2 Fans	0 to 50°C	5% to 95%	4.8x9.0x9.8" 122x229x248mm	8.7 lb.	$350
#MB IPC7T	7 Slots	2337	Full & Short	ISA	130 Watts	1 FDD & 1 HDD (3.5")	Fan	0 to 55°C	5% to 95%	7.1x9.15x15.9" 180x232x403mm	15.4 lb.	$375
#MB IPC7TP	7 Slots	2337	Full & Short	PCI/ISA	130 Watts	1 FDD & 1 HDD (3.5")	Fan	0 to 55°C	5% to 95%	7.1x9.15x15.9" 180x232x403mm	15.4 lb.	$425
#MB IPC7X	7 Slots	2347	Full & Short	ISA	250 Watts	1 FDD, 2 HDD 3.5" & 1 CD 5¼"	Fan	0 to 50°C	10% to 85%	7.6x10x16.3" 193x254x412mm	26.5 lb.	$685
#MB IPC7XP	7 Slots	2347	Full & Short	PCI/ISA	250 Watts	1 FDD, 2 HDD 3.5" & 1 CD 5¼"	Fan	0 to 50°C	10% to 85%	7.6x10x16.3" 193x254x412mm	26.5 lb.	$785
#MB 8T/TM/TP	8 Slots	2328	Full & Short	PCI/ISA	200 Watts	5 Bays (3@3.5", 2@5¼")	Fan	0 to 40°C	10% to 85%	6.8x13.8x16.8" 171x159x425mm	18.0 lb.	$**
#MB CC1	2 Slots*	2310	Short *Optional	ISA	15 Watts*	1 HDD (2.5")	Vents	0 to 50°C	20% to 90%	8.35x1.77x6.3" 212x45x160mm	5.5 lb.	$1795

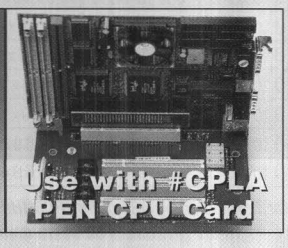
BEST BUYS in red. ***MB CC1** pkg. includes 5x86-133MHz CPU w/16MB. ****Tower (T) Chassis** are available w/Passive Backplane or Motherboard-Ready: **8TM** ($195) holds any of our MB or MF motherboards on pg. 34; for MX (ATX-style) order **#MB 8TMX**; **MB 8T** ($295) with 8-Slot ISA-bus Passive Backplane; **8TP** ($395) has 8-Slot PCI/ISA Passive Backplane (4 ISA, 1 CPU, 3 PCI slots). **Optional: #MSI 01055** 1.44 MB 3.5" Floppy Drive ($59). Accessories (keyboards, hard drives, etc.) start on page 40. **Call or see pg. 40 for power supply upgrades to 350W, +12V, +24V, or −48VDC.**

NEW PCI/ISA Bus High Speed Data Transfer in a Half-Size MicroBox!

MB IPC5NHP 5-Slot

FOD#2325

5 Half-Length Bds
65W • See pg. 24



Use with #CPLA PEN CPU Card

Patented PCI Bus Side-Mount Connector

The **#MB IPC5NHP** MicroBox features a unique PCI-bus side-mount connector to interface a 5-slot half-length passive backplane (**#PBP 05H**, 1 ISA-1 CPU-3 PCI) with the CyberResearch **#CPLA PEN** Half-Size Pentium CPU card. See page 24 for details on the **#MB IPC5NHP** 5-slot MicroBox, pg. 35 for the backplane, and page 38 for our **#CPLA PEN** Pentium CPU card. Call Fax-on-Demand for more info: 203-483-9966.

MB CC1 $1795

1.77"
Ideal for Embedded Applications
133MHz CPU Included!

Call Fax-on-Demand: FOD#2310

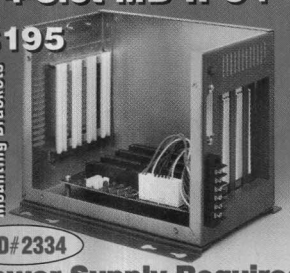
INDUSTRIAL MICROBOX™ PCs

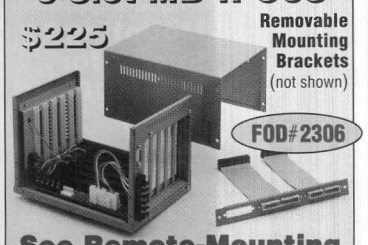
MicroBox PCs are Ideal for Table or Wall Mounting

See Remote-Mount Power Supplies: page 40

3-Slot MB IPC3S
$165
Removable Mounting Brackets
FOD#2303

Ideal for Embedded Applications

4-Slot MB IPC4
$195
Removable Mounting Brackets

FOD#2334
Power Supply Required

6-Slot MB IPC6S
$225
Removable Mounting Brackets (not shown)

FOD#2306
See Remote-Mounting Power Supplies, pg. 40

4-Slot MB IPC4NH
$330
Removable Mounting Brackets (not shown)
Floppy Drive Cover

FOD#2324
65W Power Supply
Space 3.5" FDD & HDD

MB IPC6NH / 5NHP
6 ISA or 5 PCI/ISA Half-Size
$350/$385
Removable Brackets for Floor or Side-Panel Mounting
FOD#2324
Optional: 1 ISA, 1 CPU, & 3 PCI Slots
Space for 3.5" FDD and HDD • 65W Pwr Supp.

6-Slot MB IPC6RM
6 Mid-Size ISA Slots
$365

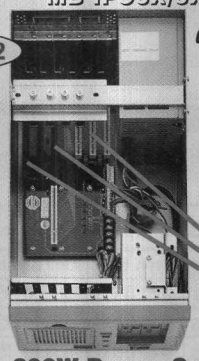
FOD#2326
Removable Brackets for Floor or Side-Panel Mounting
Space for Both 3.5" FDD & HDD • 130W Power

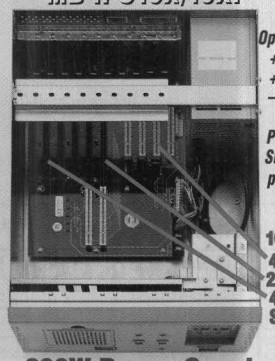
6-Slot MB IPC6RL
6 Full-Size ISA Slots
$395

Removable Brackets for Floor or Side-Panel Mounting
Space for Both 3.5" FDD & HDD • 200W Power

6-Slot MB IPC6X
$485/$585
FOD#2302
Removable Mounting Brackets
Choose: 6 ISA Slots or 2 ISA-1 CPU-3 PCI Slots

10-Slot MB IPC10X
$550/$650
Removable Mounting Brackets
Choose: 10 ISA Slots or 4 ISA-2 CPU-4 PCI Slots

MB IPC6X/6XP

Optional +12V, +24V, −48V DC Power Supply pg. 40
6XP: 3 PCI 1 CPU 2 ISA Slots
200W Power Supply

MB IPC10X/10XP

Optional +12V, +24V, −48V DC Power Supply pg. 40
10XP: 4 PCI 2 CPU 4 ISA Slots
200W Power Supply

7-Slot MB IPC7X/7XP
$585/$785

FOD#2347
IPC7X: 7 ISA Slots
IPC7XP: 3 ISA + 1 CPU + 3 PCI Slots
Optional +12V, +24V or −48VDC
See page 23 for side view
7 Half or Full-Size Boards
3 ISA-1 CPU-3 PCI • 250W

CyberResearch MicroBox Industrial PCs

Requires an All-in-One CPU Card (pp. 36-38) to use as a Stand-Alone PC Fax-on-Demand FOD#2300

Part Number	Slots	FOD#	Card Size	Type	Power Supply	Disk Drive Bays	Cooling	Oper. Temp	Rel. Humidity	Mounting Dim. (WxHxD)	Weight	Price
#MB IPC3S	3 Slots	2303	Short	ISA	–	–	Vents	0 to 60°C	10% to 90%	3.54x5.8x8.6" 90x147x218mm	3.3 lb.	$165
#MB IPC4	4 Slots	2334	Short	ISA	–	–	Vents	0 to 60°C	10% to 90%	4.7x7.1x9.1" 120x180x230mm	4.3 lb.	$195
#MB IPC6S	6 Slots	2306	Short	ISA	–	–	Vents	0 to 60°C	10% to 90%	5.9x5.8x8.6" 151x147x218mm	4.3 lb.	$225
#MB IPC4NH	4 Slots	2324	Short	ISA	65 Watts	1 HDD & 1 FDD (3.5")	Fan	0 to 55°C	10% to 90%	6.4x6.6x10.2" 162x167x259mm	6.0 lb.	$330
#MB IPC5NHP*	5 Slots	2324	Short	PCI/ISA	65 Watts	1 HDD & 1 FDD (3.5")	Fan	0 to 55°C	10% to 90%	8.1x6.6x10.2" 206x167x259mm	8.2 lb.	$385
#MB IPC6NH	6 Slots	2324	Short	ISA	65 Watts	1 HDD & 1 FDD (3.5")	Fan	0 to 55°C	10% to 90%	8.1x6.6x10.2" 206x167x259mm	8.2 lb.	$350
#MB IPC6RM	6 Slots	2326	Med & Short	ISA	130 Watts	1 HDD & 1 FDD (3.5")	Fan	0 to 55°C	5% to 95%	10.6x6.6x11.4" 271x167x290mm	20.0 lb.	$365
#MB IPC6RL	6 Slots	2326	Full & Short	ISA	200 Watts	1 HDD & 1 FDD (3.5")	Fan	0 to 55°C	5% to 95%	10.8x6.6x16.1" 276x167x410mm	22.0 lb.	$395
#MB IPC6X	6 Slots	2302	Full & Short	ISA	200 Watts	2 FDD/HDD 3.5" & 1 HDD 3.5"	Fan	0 to 50°C	10% to 85%	9.0x6.9x16.5" 230x175x419mm	22.0 lb.	$485
#MB IPC6XP	6 Slots	2302	Full & Short	PCI/ISA	200 Watts	2 FDD/HDD 3.5" & 1 HDD 3.5"	Fan	0 to 50°C	10% to 85%	9.0x6.9x16.5" 230x175x419mm	22.0 lb.	$585
#MB IPC7X	7 Slots	2347	Full & Short	ISA	250 Watts	1 FDD & 2 HDD 3.5", 1 CD 5¼"	Fan	0 to 50°C	10% to 85%	7.6x10x16.3" 193x254x412mm	26.5 lb.	$685
#MB IPC7XP	7 Slots	2347	Full & Short	PCI/ISA	250 Watts	1 FDD & 2 HDD 3.5", 1 CD 5¼"	Fan	0 to 50°C	10% to 85%	7.6x10x16.3" 193x254x412mm	26.5 lb.	$785
#MB IPC10X	10 Slots	2302	Full & Short	ISA	200 Watts	2 FDD/HDD 3.5" & 1 HDD 3.5"	Fan	0 to 50°C	10% to 85%	12.6x6.9x16.5" 320x175x419mm	26.5 lb.	$550
#MB IPC10XP	10 Slots	2302	Full & Short	PCI/ISA	200 Watts	2 FDD/HDD 3.5" & 1 HDD 3.5"	Fan	0 to 50°C	10% to 85%	12.6x6.9x16.5" 320x175x419mm	26.5 lb.	$650

BEST BUYS in red. ***See CPU cards on pp 36-38.*** ***Optional: #MSI 01055*** *1.44 MB 3.5" Floppy Drive* ($59). *Hard drives on pg 43.* ****MB IPC5NHP*** *with PCI/ISA Backplane (1 ISA, 1 CPU, & 3 PCI Half-Size slots) requires* ***CPLA PEN*** *CPU – see pages 23 & 38.* **Call or see page 40 for power supply upgrades (available on some models) to 350W, +12V, +24V, or −48VDC.**

CyberResearch Assistance: Toll-Free 1-800-341-2525 (USA) ☎ Tel: 203-483-8815 Fax: 203-483-9024
Applications Engineers: Mon-Fri, 9 AM-5 PM U.S. Eastern Time • **Internet Website:** http://www.cyberresearch.com • **Fax-on-Demand System:** 203-483-9966 • **BBS:** 203-488-8949

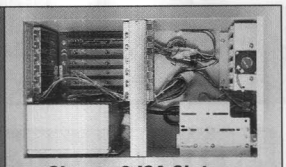
6-Slot MB IPC6N/6NP

$395/$450 FOD#2327

BE$T VALUE!

Removable Brackets for Floor or Side-Panel Mounting

6 Half or Full-Size Brds • Space for FDD & 3.5" HDD • 200W



Choose 6 ISA Slots or 2 ISA, 1 CPU, & 3 PCI Slots

Optional +12V, +24V or −48VDC Supply

6-Slot MB IPC60

$425 FOD#2336

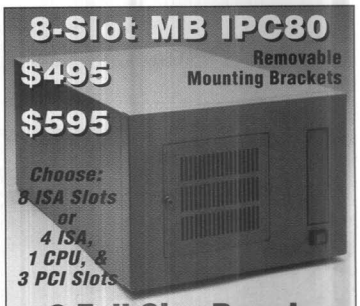
6 Full-Size Boards • 100W

8-Slot MB IPC80

$495 Removable Mounting Brackets

$595

Choose: 8 ISA Slots or 4 ISA, 1 CPU, & 3 PCI Slots



8 Full-Size Boards

5-Slot MB IPC5FP

$545

Removable Mounting Brackets

5 Half or Full-Size Boards
2 ISA-1 CPU-2 PCI • 150W

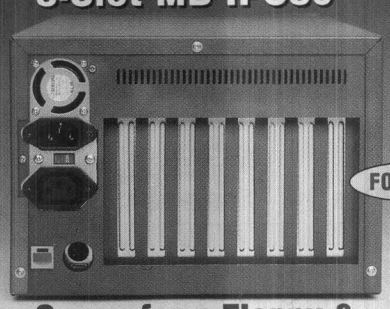
6-Slot MB IPC6HA/6

$465 $495

Removable Mounting Brackets

6 Half-Length (HA) or
6 Full-Size Boards • 100/150W

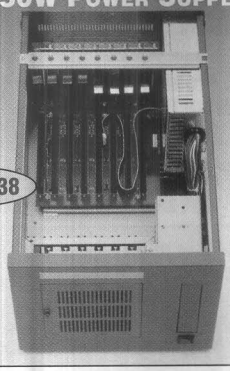
8-Slot MB IPC80



FOD#2338

Space for a Floppy & a 3.5" Hard Disk Drive

MB IPC80 150W Power Supply



6 & 11-Slot MB IPC6C & IPC11C S/M/L

$275-$395

FOD#2340

MB IPC11CL • 130W
Industrial Card Cages w/6 or 11 Slots

6, 8, & 14-Slot MB CC6N/8N/14N

Industrial Card Cages • 200W

FOD#2341

$275-$450

See page 4A

8/10-Slot MB IFC

$400 MB IFC8N MB IFC10N

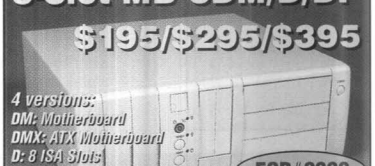
FOD#2318

Wall or Benchtop-Mount
Full-Size Boards • 250W

8-Slot MB 8DM/D/DP

$195/$295/$395

4 versions:
DM: Motherboard
DMX: ATX Motherboard
D: 8 ISA Slots
DP: 3 ISA, 2 CPU, 3 PCI Slots



FOD#2328

Desktop w/Room for
8 Full-Size Boards • 200W

Quantity Discounts: 1-4/List 5-9/5% 10-24/10% 25-49/15%

Quantities of a Single Item Per Shipment – Call for Details

CyberResearch MicroBox Industrial PCs

Requires an All-in-One CPU Card (pp. 36-38) to use as a Stand-Alone PC — Fax-on-Demand FOD#2300

Part Number	Slots	FOD#	Card Size	Type	Power Supply	Disk Drive Bays	Cooling	Oper. Temp	Rel. Humidity	Mounting Dim. (WxHxD)	Weight	Price
#MB IPC6N	6 Slots	2327	Full & Short	ISA	200W (see pg. 40)	2 HDD & 1 FDD (3.5")	Fan	0 to 55°C	10% to 90%	9.3x6.8x16.1" 236x173x409mm	11.5lb.	$395
#MB IPC6NP	6 Slots	2327	Full & Short	PCI/ISA	200W (see pg. 40)	2 HDD & 1 FDD (3.5")	Fan	0 to 55°C	10% to 90%	9.3x6.8x16.1" 236x173x409mm	11.5lb.	$450
#MB IPC6HA	6 Slots	2346	Short	ISA	100 Watts	1 HDD & 1 FDD (3.5")	Fan	0 to 50°C	10% to 95%	7.7x6.7x11.3" 196x170x287mm	9.9lb.	$465
#MB IPC5FP*	5 Slots	2345	Full & Short	PCI/ISA	150 Watts	1 HDD & 1 FDD (3.5")	Fan	0 to 50°C	10% to 95%	6.5x6.7x15.5" 166x170x393mm	12.3lb.	$545
#MB IPC6	6 Slots	2346	Full & Short	ISA	150 Watts	1 HDD & 1 FDD (3.5")	Fan	0 to 50°C	10% to 95%	6.5x6.7x15.5" 166x170x393mm	12.3lb.	$495
#MB IPC60	6 Slots	2336	Full & Short	ISA	100 Watts	1 HDD & 1 FDD (3.5")	Fan	0 to 50°C	10% to 85%	7.7x6.1x15.7" 195x156x397mm	13.0lb.	$425
#MB IPC80	8 Slots	2338	Full & Short	ISA	150 Watts	1 HDD & 1 FDD (3.5")	Fan	0 to 50°C	10% to 85%	9.8x7.1x16.9" 250x180x430mm	16.8lb.	$495
#MB IPC80P	8 Slots	2338	Full & Short	PCI/ISA	150 Watts	1 HDD & 1 FDD (3.5")	Fan	0 to 50°C	10% to 85%	9.8x7.1x16.9" 250x180x430mm	16.8lb.	$595
#MB 8D	8 Slots	2328	Full & Short	ISA	200W (see pg. 40)	6 Bays (3@3.5", 3@5¼")	Fan	0 to 40°C	10% to 85%	17x6.3x16.8" 432x180x425mm	18.0lb.	$295
#MB 8DM/DP	8 Slots	2328	Full & Short	PCI/ISA	200W (see pg. 40)	6 Bays (3@3.5", 3@5¼")	Fan	0 to 40°C	10% to 85%	17x6.3x16.8" 432x180x425mm	18.0lb.	$**
#MB IFC8N/NP	8 Slots	2318	Full	ISA or PCI	250W (see pg. 40)	3 Bays (2@3.5", 1@5¼")	2 Fans	0 to 50°C	10% to 95%	13x6.8x16" 330x172x407mm	31lb.	$400 ISA $450 PCI
#MB IFC10N/NP	10 Slots	2318	Full	ISA or PCI	250W (see pg. 40)	3 Bays (2@3.5", 1@5¼")	2 Fans	0 to 50°C	10% to 95%	13x6.8x16" 330x172x407mm	31lb.	$435 ISA $495 PCI
#MB IPC6CS	6 Slots	2340	Short (to 6.8" L)	ISA	60 Watts	none	Vents	0 to 55°C	5% to 95%	9.0x5.2x8.0" 229x132x203mm	5.0lb.	$275
#MB IPC6CL	6 Slots	2340	Full (to 13.6" Long)	ISA	130 Watts	none	Fan	0 to 55°C	5% to 95%	9.0x5.2x14.5" 229x132x369mm	8.0lb.	$335
#MB IPC11CM	11 Slots	2340	Med (to 8.8" Long)	ISA	130 Watts	none	Fan	0 to 55°C	5% to 95%	13.0x5.2x9.6" 330x132x244mm	8.0lb.	$365
#MB IPC11CL	11 Slots	2340	Full (to 13.6" Long)	ISA	130 Watts	none	Fan	0 to 55°C	5% to 95%	13.0x5.2x14.5" 330x132x369mm	8.8lb.	$395
#MB CC6N/NP	6 Slots	2341	Full	ISA or PCI	200W (see pg. 40)	1 HDD (3.5")	Fan	0 to 55°C	5% to 95%	7.5x6.5x14.5" 191x165x369mm	Call	$275 ISA $325 PCI
#MB CC8N/NP	8 Slots	2341	Full	ISA or PCI	200W (see pg. 40)	1 HDD (3.5")	2 Fans	0 to 55°C	5% to 95%	10.6x6.5x14.5" 270x165x369mm	Call	$295 ISA $345 PCI
#MB CC14N/NP	14 Slots	2341	Full	ISA or PCI	200W (see pg. 40)	1 HDD (3.5")	2 Fans	0 to 55°C	5% to 95%	14.2x6.5x14.5" 361x165x369mm	Call	$350 ISA $450 PCI

BEST BUYS in red. ***IPC5FP** has ***PCI/ISA*** Backplane (2 ISA, 1 CPU, 2 PCI half-length slots). ****Desktop (D) Chassis**: #MB 8DM ($195) holds MB or MF motherboards on pg. 34; for ATX-style order #MB 8DMX; #MB 8DP ($395) has a PCI/ISA Backplane (4 ISA, 1 CPU, 3 PCI slots). **See motherboards & All-in-One CPU cards on pp. 34-38.** Accessories start on pg 40.

CyberResearch Industrial Rack-Mount PCs with 8, 12, 14, & 20-Slot ISA or PCI/ISA Passive Backplanes

RPA 14: 8 to 14-Slot Industrial Chassis
(Motherboard-Ready version available)

BEST VALUE!

PCI/ISA-Bus: $695 **ISA-Bus: $595**

Motherboard-Ready Chassis: $500

RPA 14 NEMA 1 Industrial / Telephony Rack-Mount PC System includes:

- **14-slot ISA or PCI/ISA-bus passive backplane** with room for 10 full-height/full-length & 4 full-height/half-length cards. Hold-down clamp keeps your cards firmly seated in the expansion slots.
- Use an **All-in-One Pentium CPU card** (pp. 36-38) with a **14-slot ISA-bus** or a **14-slot PCI/ISA-bus passive backplane;** AT & ATX Motherboard versions available (see pp. 34 & 35).
- **Positive-pressure cooling system** (via 82 CFM fan) with **Front-accessible fan air filter.**
- 19" **W**ide at Flanges; 7" **H**igh (4 Rack Units); 20" **D**eep (483 **W** x 178 **H** x 508 **D** mm). Wt: 27 lbs/12.3 kg.
- **250-Watt power supply** (300W or 400W optional); operates from 90-135VAC or 180-270VAC, at 47 to 63Hz. Order **PSA 25548** to upgrade to **–48VDC Power Supply (250W)**.
- **5 Front-Accessible Shock-Mounted Drive Bays:** ***a 3.5" 1.44MB Floppy is included,*** with room for a second 3.5" drive, plus three 5.25" drive bays. **Lockable disk drive bay door.**
- All steel & aluminum construction. Keyboard sockets in both front and rear of unit.

N1C 14: 8 to 14-Slot Basic Chassis
(Motherboard-Ready version available)

Hard Drive & Power Indicators See page 32 for other models.

PCI/ISA-Bus: $695 **ISA-Bus: $595**

Motherboard-Ready Chassis: $500

N1C Series 14-slot (or 8-slot Motherboard-Ready) Rack-Mount PCs Feature:

- **Choice of 14-slot PCI/ISA-bus (8 ISA, 2 CPU/ISA, & 4 PCI Slots) or 14-slot ISA-bus passive backplane** with room for 10 full-height/full-length & 4 full-height/half-length cards. Hold-down clamp keeps cards firmly seated in the expansion slots. Use an **All-in-One Pentium** or **'486 CPU card** with Passive Backplane computer chassis – see pages 36-38.
- **Optional Motherboard-Ready Chassis** supports 8-slot standard Baby-AT or ATX (special order) motherboards. Specify type of motherboard at time of order (see motherboards on pg. 34).
- ***NEMA 1*** **EIA 19" Rack-Mountable Chassis** is 19" **W**ide at Flanges; only 7" (4 Rack Units) **H**igh, 18.5" **D**eep (483 **W** x 178 **H** x 470 **D** mm). Body of chassis is 16.75" (425mm) wide. 44 lbs/20 kg.
- **250-Watt power supply,** 90-130/180-270VAC, 47-63Hz. (Optional 350-Watt supply: add $100).
- **Shock-mounted drive cage** provides room for a ***3.5" 1.44MB Floppy (included with unit)*** (front-accessible). Room for **two** half-height **5.25"** drives (front-accessible), plus **one** 3.5" hard disk drive (internal mounting).
- **Front Access Drive Bay & Filter Doors**, with dual keyboard sockets (in the front & rear). Built-in speaker, power, and reset switches, key-lock switch, plus power and hard drive LEDs. Protective front door with key-lock are provided for added system security.
- **Fan Cooling System (56 CFM)** with field-removable air filter (in addition to power supply fan).
- **Operating Temp:** +32 to +122°F, (0 to +50°C) • **Relative Humidity:** 5-95% @ 40°C non-condensing.
- **An ideal low-cost solution for volume OEM applications. Call for Quantity Discounts.**

N1D 14: 8 to 14-Slot Basic Chassis
(Motherboard-Ready version available)

See page 32 for other models

PCI/ISA-Bus: $895 **ISA-Bus: $795**

Motherboard-Ready Chassis: $700

N1D Series 14-slot (or 8-slot Motherboard-Ready) Rack-Mount PCs Feature:

- **Choice of 14-slot PCI/ISA-bus (8 ISA, 2 CPU/ISA, & 4 PCI Slots) or 14-slot ISA-bus passive backplane** with room for 14 full-height/full-length cards. Use an **All-in-One Pentium** or **'486 CPU card** with our N1D-series Passive Backplane computer chassis – see pages 36-38.
- **Optional Motherboard-Ready Chassis** supports 8-slot standard Baby-AT or ATX (special order) motherboards. Specify type of motherboard at time of order (see motherboards on pg. 34).
- ***NEMA 1*** **EIA 19" Rack-Mountable Chassis** is 19" **W**ide at Flanges; only 8.75" (5 Rack Units) **H**igh, 25" **D**eep (483 **W** x 222 **H** x 635 **D** mm). Body of chassis is 17" (432mm) wide. 53 lbs/24 kg.
- **300-Watt power supply,** 90-130/180-270VAC, 47-63Hz; (optional: add $**100** for 350W or add $**200** for 400W). **+12V, +24V, or –48VDC versions available on a Special-Order basis.**
- **Shock-mounted drive cage** provides room for a ***3.5" 1.44MB Floppy (included with unit)*** (front-accessible). Room for a total of **six** half-height **5.25"** drives (front-accessible), plus **two 5.25"** hard disk drives (internal). Qty. ten front-accessible 3.5" drives available by Special Order.
- **Front Accessible Drive Bay & Filter Doors**, with dual keyboard sockets (in the front & rear). Built-in speaker, power, and reset switches, key-lock switch, plus power and hard drive LEDs. Protective front door with key-lock are provided for added system security.
- **Fan Cooling System via Two 82 CFM Fans** (in addition to the power supply fan).
- **Operating Temp:** +32 to +122°F, (0 to +50°C) • **Relative Humidity:** 5-95% @ 40°C non-condensing.
- **Available on a Special Order basis with Dual Hot-Swappable 300W Power Supplies.**

RXS 1225: 12-Slot Industrial Chassis

Lock up your PC until you need to access it.
Filter protects against airborne contaminants.

ISA-Bus: $895

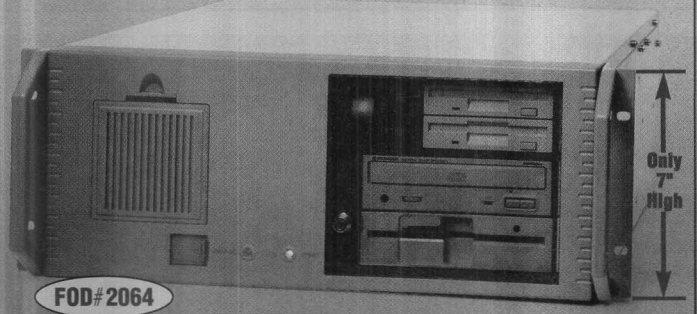
Unique Front-Access Pull-out Drawer

RXS 1225 NEMA 1 Rack-Mount PC System includes:

- **12-slot** ISA-bus **passive backplane** with room for full-height/3 half-length & 9 full-length plug-in cards, with hold-down clamp.
- **Positive-pressure dual-fan cooling system.**
- 19" **W**ide at Flanges; only 7" **H**igh (4 Rack Units); 17.7" **D**eep. (483 **W** x 178 **H** x 450 **D** mm). Weight: 30 lbs.
- **250-Watt power supply** operates from 90-130VAC or 180-270VAC, at 47 to 63Hz.
- ***3.5" 1.44MB Floppy included w/unit.*** Room for **3** half-height **5.25"** drives (front-accessible).
- **Locking Front Access Drive Bay & Filter Door**, with keyboard sockets in the front & rear.
- **Unique slide-out feature allows for complete removal/access to the card cage and drive bays for easy assembly & maintenance.**

CyberResearch Assistance: Toll-Free 1-800-341-2525 (USA) Tel: 203-483-8815 Fax: 203-483-9024
Applications Engineers: Mon-Fri, 9AM-5PM U.S. Eastern Time • **Internet Website:** http://www.cyberresearch.com • **Fax-on-Demand System:** 203-483-9966 • **BBS:** 203-488-8949

N1A 14: Chassis w/Choice of ISA or PCI 14-Slot Bus



FOD#2064

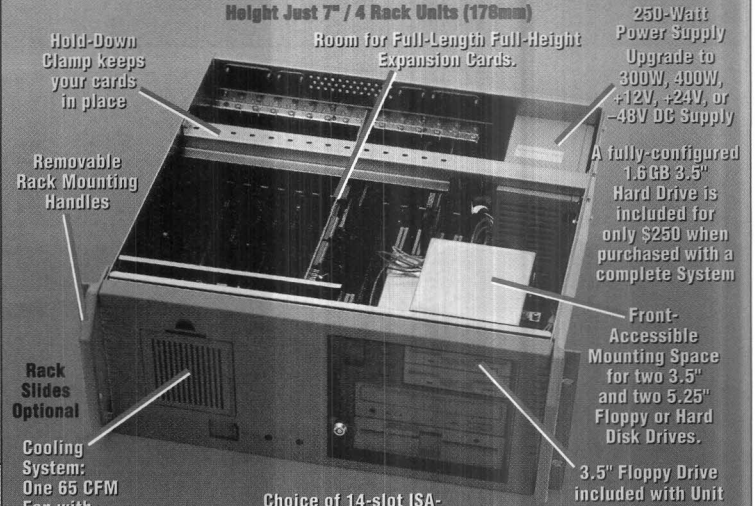
ISA-Bus: $695
PCI-Bus: $795
AT or ATX: $600

Locking Door Protects Floppy Drives, Keyboard Connector, and Reset Switches. Two Reset Switches provided for Dual System Applications. (2 PCs in 1 – see below or call for full details.)

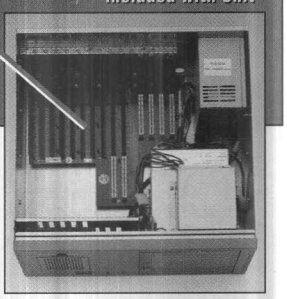
N1A 14-slot 7" High (4RU) Rack-Mount PC Features:

- **14-slot ISA or PCI/ISA-bus passive backplane** with room for 10 full-height/full-length & 4 full-height/half-length cards. Hold-down clamp keeps cards firmly seated in the expansion slots. A solid cover (shown above) prevents objects from falling into the chassis and ensures proper cooling.
- Use an **All-in-One Pentium** or **'486 CPU card** with a **14-slot ISA-bus** or **PCI/ISA-bus passive backplane** (8 ISA, 4 PCI, & 2 CPU/ISA slots); or use a **Pentium/486 motherboard** with 2 ISA slots, 3 PCI slots, & 1 PCI or ISA slot. See other PCI-bus backplane options on pg 35.
- **Locking Door** provides access to two 3.5" & two 5.25" Floppy/Hard Disks, two Reset Switches (for Dual-CPU Units, Special Order), & Keyboard Port. ***1.44MB Floppy Drive included w/each unit.***
- **250-Watt Power Supply** operates from 90-135VAC or 180-265VAC (switchable), at 47-63Hz. Upgrade to **+12V, +24V, –48VDC, 300W or 400W versions – see Ordering Info or call.**
- **Operating Temperature:** +32 to +122°F (0 to +50°C) • **Storage Temp:** +32 to +158°F (0 to +70°C)
- **Removable Rack-Mount Handles** facilitate either rack or desktop mounting.

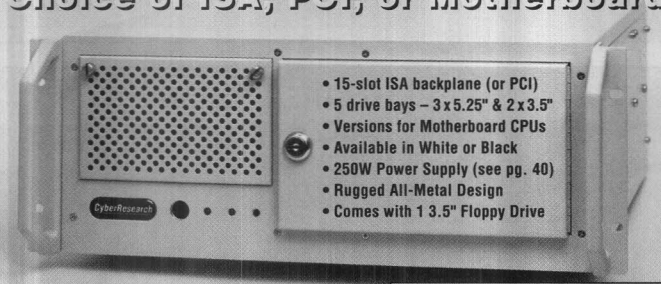
N1A 14: Industrial Rack-Mount PCs



- ***NEMA 1*** **EIA 19" Rack-Mountable Chassis** is 19" **W**ide at Flanges; only 7" **H**igh (4 Rack Units), 17" **D**eep (483**W** x 178**H** x 430**D** mm). Width 17" (430mm) without Rack Handles. Weight: 33 lbs (15 kg).
- **Optional Dual PC System Passive Backplanes** ISA w/6 & 8 slots; PCI (2-2-2 & 2-1-4 ISA-CPU/ISA-PCI slots)



RRB 15-Slot Chassis with Choice of ISA, PCI, or Motherboard

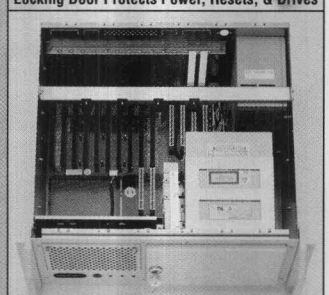


ISA-Bus: $745
PCI-Bus: $795

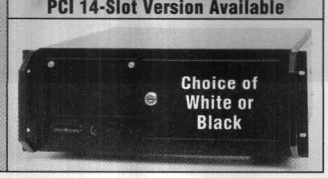
FOD#2015

Front access to one 3.5" & three 5.25" Drives

Locking Door Protects Power, Resets, & Drives



PCI 14-Slot Version Available



RRB 15: 15-slot 7" High Rack-Mount PC Features:

- **15-slot** ISA-bus **passive backplane** with room for full-height/full-length plug-in adapter cards. Hold-down clamp keeps cards firmly seated. Optional **PCI** 14-slot backplane (8 ISA, 2 CPU/ISA, & 4 PCI slots) or **Motherboard**-ready versions (MB, or MX for ATX).
- Use with **All-in-One Pentium** or **'486 CPU card** (pp. 36-38) or an MB or MX **Motherboard** (pg. 34).
- ***NEMA 1*** **EIA 19" Rack-Mountable Chassis** is 19" **W**ide at Flanges; only 7" **H**igh (4 RU); 17" **D**eep (483**W** x 178**H** x 432**D** mm). Removable rack handles (chassis **W**idth: 17"/432 mm). Weight: 33 lbs (15 kg).
- **Positive-pressure filtered cooling system with 2 ball-bearing fans.** Front-access filter for easy cleaning.
- ***3.5" Floppy Drive included w/unit.*** Room for three front-accessible **5.25"** half-height drives plus 1 internal **3.5"** hard disk drive bay. LED Indicators, power & reset switches, & keyboard port located on the front panel; additional keyboard port on rear panel.
- **250-Watt Power Supply** operates from 90-135VAC or 180-265VAC, at 47-63Hz. **Upgrade** to +12V, +24V, –48VDC, 300W, or 400W versions – see page 40.
- **Operating Temperature:** +32 to +122°F (0 to +50°C)
- **Storage Temperature:** +32 to +158°F (0 to +70°C)

Ordering Information: ***See PC System Comparison Chart on page 39***

NEMA 1 Industrial-Duty Passive Backplane Rack-Mount PCs

#N1C 14	Rack-Mount PC, 14 **ISA** Slots, 250W	$595
#N1C 14P	Rack-Mount PC, 14 **PCI/ISA** Slots: 4PCI/2CPU/8ISA, 250W	**$695**
#N1C 14MR	Rack-Mount PC, Motherboard Ready, 250W	**$500**
#N1D 14	Rack-Mount PC, 14 **ISA** Slots, 300W	**$795**
#N1D 14P	Rack-Mount PC, 14 **PCI/ISA** Slots: 4PCI/2CPU/8ISA, 300W	**$895**
#N1D 14MR	Rack-Mount PC, Motherboard Ready, 300W	**$700**
#RXS 1225	Rack-Mount PC, 12 **ISA** Slots, 250W (Pull-out Chassis)	**$895**
#RPA 14	Rack-Mount PC, 14 **ISA** Slots, 250W	$595
#RPA 14P	Rack-Mount PC, 14 **PCI/ISA** Slots: 4PCI/2CPU/8ISA, 250W	**$695**
#RPA MB	Rack-Mount PC, Motherboard Ready, 250W (ATX version: **MX**)	**$500**
#N1A 14	Rack-Mount PC, 14 **ISA** Slots, 250W	$695
#N1A 14P	Rack-Mount PC, 14 **PCI/ISA** Slots: 4PCI/2CPU/8ISA, 250W	**$795**
#N1A 14MR	Rack-Mount PC, Motherboard Ready, 250W (ATX version: **MX**)	**$600**
Add **–D** Suffix to **N1A 14** Part # for **Dual PC** backplane w/ISA (6 & 8 ISA slots)		**$100**
Add **–D** Suffix to **N1A 14P** Part # for **Dual PC,** PCI/ISA (6 & 7 slots, 2I-2C-2P & 2-1-4)		**$100**
#RRB 15	Rack-Mount PC, **15 ISA** Slots, 250W, White Chassis	**$745**
#RRB 15P	Rack-Mount PC, **14 PCI/ISA** Slots: 4PCI/2CPU/8ISA, 250W	**$795**
#RRB 15MB	Rack-Mount PC, Motherboard Ready, 250W (ATX version: **MX**)	**$650**
Add **–BLK** Suffix to RRB 14 Rack-Mt. PC Part # for **Black Chassis**		**$N/C**

Optional Rack Slides: call for correct part number (specify rack depth) **$85-95**

Power Supply Upgrades: see page 40 for additional power supply options.

Note: All Rack-Mount PCs include a 3.5" 1.44MB floppy drive; see pg. 43 for hard disk drives.

IMPORTANT: All passive-backplane units require an All-in-One CPU card – see pages 36-38 for details. For motherboard-based PCs see pages 34-39.

Popular Accessories: External Color SVGA Monitors and **Graphics Display Adapters** start on page 12. **Rack-Mount Keyboards** and other accessories start on page 40.

#MSI 21000C 1.6 GB (1600 MB) IDE Hard Drive (when purch. w/system) .. **$250**

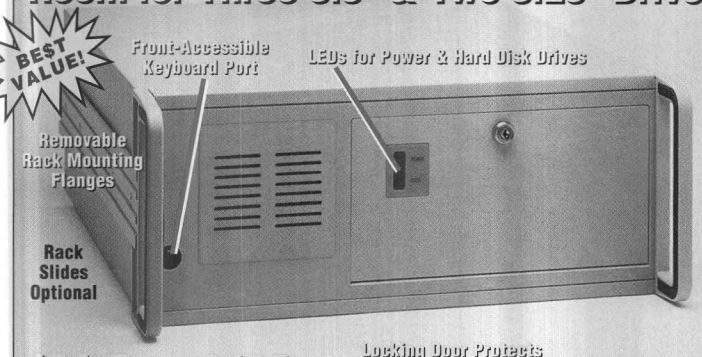
QUANTITY DISCOUNTS: 1-4/LIST 5-9/5% 10-24/10% 25-49/15%

Quantities of a Single Item Per Shipment – Call for Details

CyberResearch Industrial Rack-Mount PCs with 7, 14, & 20-Slot ISA or PCI/ISA Passive Backplanes

RNA 14 Chassis • 14-Slot PCI/ISA Bus Room for Three 3.5" & Two 5.25" Drives

BEST VALUE!



ISA-Bus: $495
PCI-Bus: $595

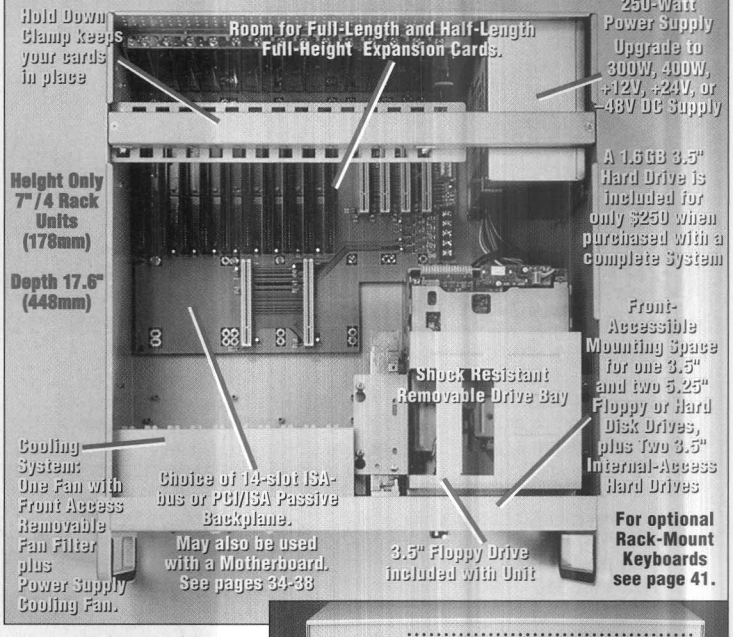
Locking Door Protects Floppy Drives, Keyboard Connector, Power On/Off, and Reset Switches.

FOD#2124

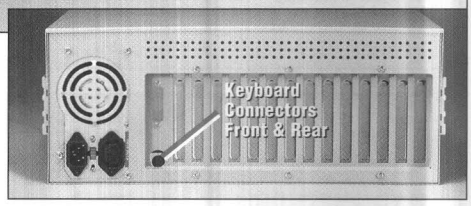
RNA 14-slot 7" High (4RU) Rack-Mount PC Features:

- **14-slot ISA or PCI/ISA-bus passive backplane** with room for 10 full-height/full-length & 4 full-height/half-length cards. Hold-down clamp keeps cards firmly seated in the expansion slots. A solid cover (shown above) prevents objects from falling into the chassis and ensures proper cooling.
- Use an **All-in-One Pentium** or **'486 CPU card** with a **14-slot ISA-bus** or a **PCI/ISA-bus passive backplane** (8 ISA, 4 PCI, & 2 ISA/CPU slots); or use a 7-slot **Pentium/486 motherboard** (see page 34). See other PCI-bus backplane options on page 35.
- **Locking Door** provides front access to **One 3.5" & Two 5.25" Floppy/Hard Disks, Two Internal 3.5" Hard Disks,** On/Off Switch, Reset Switch, LEDs for Power & Hard Disk Drive (HDD). Front & Rear-accessible Keyboard Ports. ***A 1.44MB Floppy Drive included with each unit.***
- **250-Watt Power Supply** operates from 90-135VAC or 180-265VAC (switchable), at 47-63Hz. Upgrade to **+12V, +24V, –48VDC, 300W or 400W versions – see Ordering Info or call.**
- **Operating Temperature:** +32 to +122°F (0 to +50°C) • **Storage Temp:** +32 to +158°F (0 to +70°C)
- **Removable Rack-Mount Flanges** facilitate either rack or desktop mounting. **FOD# 2124**

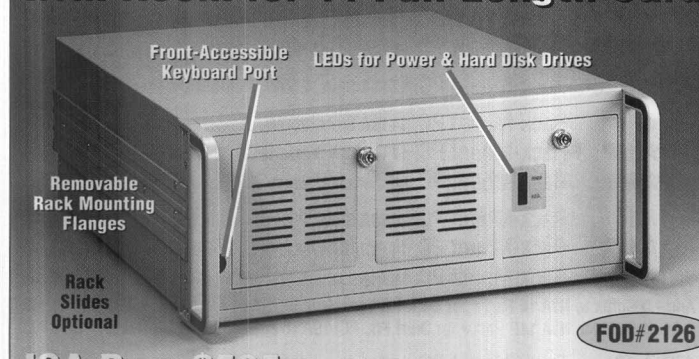
RNA 14: Industrial Rack-Mount PCs



- ***NEMA-1*** **EIA 19" Rack-Mountable Chassis** is 19" **W**ide at Flanges; only 7" **H**igh (4 RU), 17.6" **D**eep. (483**W** x 178**H** x 448**D** mm). Weight: 15 kg./33 lbs.



RNB 14 Chassis • PCI/ISA Bus with Room for 14 Full-Length Cards



FOD#2126

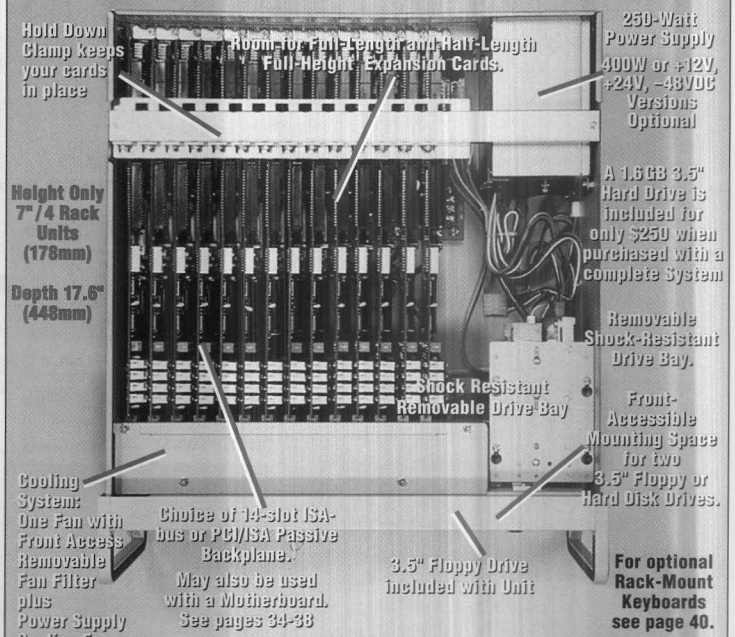
ISA-Bus: $595
PCI-Bus: $695

Locking Door Protects Floppy Drives, Keyboard Connector, Power On/Off, and Reset Switches.

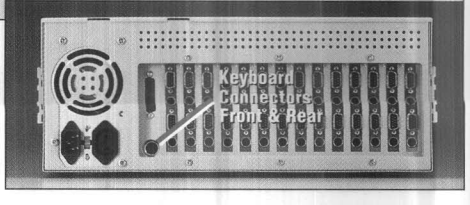
RNB 14-slot 7" High (4RU) Rack-Mount PC w/Room for 14 Full-Length Cards features:

- **14-slot ISA or PCI/ISA-bus passive backplane** with room for **14 Full or Half-Length, Full-height Cards.** Hold-down clamp keeps cards firmly seated in the expansion slots. A solid cover (shown above) prevents objects from falling into the chassis and ensures proper cooling.
- Use an **All-in-One Pentium** or **486 CPU card** with a **14-slot ISA-bus** or a **PCI/ISA-bus passive backplane** (8 ISA, 4 PCI, & 2 ISA/CPU slots); or use a 7-slot **Pentium/486 motherboard** (see page 34). See other PCI-bus backplane options on page 35.
- **Locking Door** provides front access to **Two 3.5" Floppy/Hard Disks,** On/Off Switch, Reset Switch, LEDs for Power & HDD, 2 Keybd. Ports. ***A 1.44MB Floppy Drive included w/each unit.***
- **250-Watt Power Supply** operates from 90-135VAC or 180-265VAC (switchable), at 47-63Hz. Upgrade to **+12V, +24V, –48VDC, 300W or 400W versions – see Ordering Info or call.**
- **Cooling System:** Two fans provide positive air pressure. Hinged door provides front access to a removable/washable air filter to facilitate maintenance.
- **Operating Temperature:** +32 to +122°F (0 to +50°C) • **Storage Temp:** +32 to +158°F (0 to +70°C)
- **Removable Rack-Mount Flanges** facilitate either rack or desktop mounting. **FOD# 2126**

RNB 14: Industrial Rack-Mount PCs



- ***NEMA 1*** **EIA 19" Rack-Mountable Chassis** is 19" **W**ide at Flanges; only 7" **H**igh (4 RU), 17.6" **D**eep. (483**W** x 178**H** x 448**D** mm). Weight: 15 kg./33 lbs.



CyberResearch Assistance: Toll-Free 1-800-341-2525 (USA) ☎ Tel: 203-483-8815 Fax: 203-483-9024
Applications Engineers: Mon-Fri, 9AM-5PM U.S. Eastern Time • **Internet Website:** http://www.cyberresearch.com • **Fax-on-Demand System:** 203-483-9966 • **BBS:** 203-488-8949

RNC 20: Chassis • PCI/ISA Bus with Room for 20 Full-Length Cards

FOD#2128

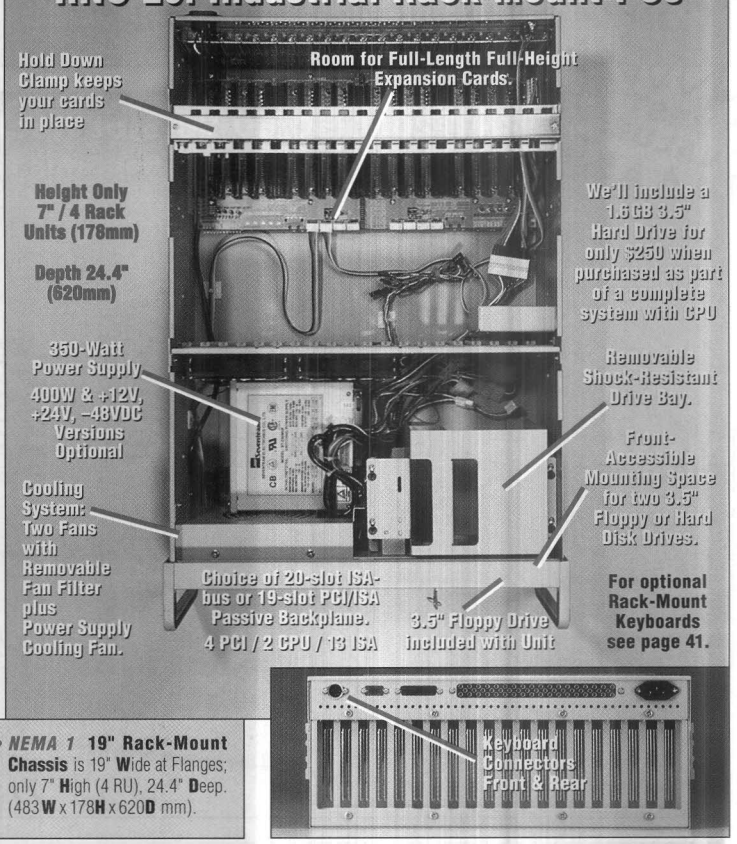
ISA-Bus: $895
PCI-Bus: $995

Locking Door Protects Floppy Drives, Keyboard Connector, Power On/Off, and Reset Switches.

RNC 20-slot 7" High (4 RU) Rack-Mount PC w/Room for 20 Full-Length Cards features:

- **ISA** (20-slot) **or PCI/ISA-bus** (19-slot) **passive backplane** with room for **20 or 19 Full-Length, Full-Height Cards.** Optional **19P** model with **19-slot** PCI/ISA-bus **passive backplane** has 4 PCI / 2 CPU / 13 ISA slots. Hold-down clamp keeps cards firmly seated in the expansion slots. A solid cover (shown above) prevents objects from falling into the chassis & ensures proper cooling.
- Use an **All-in-One Pentium** or **'486 CPU card** with a **20-slot ISA-bus** backplane or choose our **19-Slot PCI/ISA passive backplane** (13 ISA, 4 PCI, & 2 CPU slots). Backplane info: page 35.
- **Locking Door** provides front access to **one 3.5" & two 5.25" floppy/hard disks, plus two internal 3.5" hard drive bays,** on/off switch, reset switch, and LEDs for power & hard disk. Unit includes a front keyboard port. ***A 1.44MB Floppy Drive is included with each unit.***
- **350-Watt Power Supply** operates from 90–135VAC or 180–265VAC, at 47 to 63Hz. **+12V, +24V, –48VDC, and 400W power supply upgrades available – see page 40.**
- **Cooling System:** Two fans provide positive internal air pressure to keep out dust & contaminants. Hinged door provides front access to a removable/washable air filter to facilitate field maintenance.
- **Operating Temperature:** +32 to +122°F (0 to +50°C) • **Storage Temp:** +32 to +158°F (0 to +70°C)
- **Removable Rack-Mount Flanges** facilitate either rack or desktop mounting. • Wt: 33 lbs (15 kg).

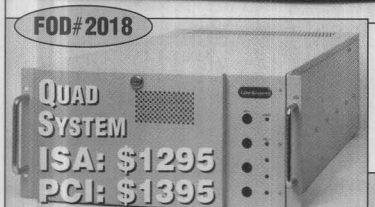
RNC 20: Industrial Rack-Mount PCs



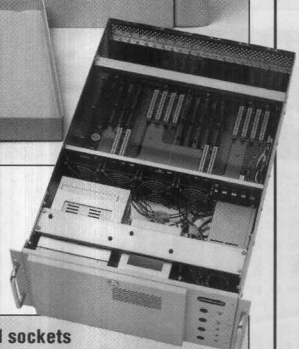
- ***NEMA 1*** **19" Rack-Mount Chassis** is 19" **W**ide at Flanges; only 7" **H**igh (4 RU), 24.4" **D**eep. (483**W** x 178**H** x 620**D** mm).

RRA 2044: Quad PC Chassis w/Room for 20 Full Length Cards

FOD#2018



300W AC or DC Power Supply



RRA 2044 Rack-Mount Quad PC includes:

- **20-slot ISA-bus passive backplane** which is segmentable into **four 5-slot PCs**. Hold down clamp secures cards against shock & vibration; room for full-length cards. Optional 16-slot segmented **PCI** passive backplane (**DP16** has **4 PCs, each with:** 2 PCI, 1 PCI or ISA, 1 CPU).
- Use w/All-in-One Pentium or '486 CPU cards.
- 19" **W**ide; 8.75" **H**igh (5 Rack Units); 25.7" **D**eep (483**W**x222**H**x653**D**mm). Weight: 49 lbs (22 kg).
- Heavy duty **Cooling System with 4 Fans** (plus power supply fan) provides over **150CFM** of air.
- **4 Keyboard sockets** located in both front *and* rear, plus **4 Reset Buttons and 4 Hard Drive LEDs.**
- One ***3.5" Floppy Drive included with unit.*** Room for a total of **four 5.25" CD-ROM** or other devices & **four 3.5" drives** or devices.
- Rugged all-metal chassis; mounting flanges with handles are removable for non-rack applications.
- **300-Watt power supply** — operates from 90-130VAC or 180-270VAC, at 47 to 63Hz. **Upgrade to 350W, 400W AC, –48VDC, +12VDC,** or **+24VDC** power supply – see pg. 40.
- **Locking doors** protect access to disk/power section and removable cooling system filters.

Ordering Information: ***See PC System Comparison Chart on page 39***

NEMA 1 Industrial-Duty Passive Backplane Rack-Mt PCs

14-Slot PCI/ISA • Room for Three 3.5" & Two 5.25" Drives

#RNA 14	Rack-Mount PC, 14 **ISA** Slots, **250W**	**$495**
#RNA 14P	Rack-Mount PC, 14 **PCI/ISA** Slots, **250W** (4 PCI/2 CPU/8 ISA)	**$595**
#RNA 14MR	Rack-Mt. PC, Motherboard Ready, **250W** (ATX version: **MX**)	**$400**

14-Slot PCI/ISA Full Length Cards • Room for Two 3.5" Drives

#RNB 14	Rack-Mount PC, 14 **ISA** Slots, **250W**	**$595**
#RNB 14P	Rack-Mount PC, 14 **PCI/ISA** Slots, **250W** (4 PCI/2 CPU/8 ISA)	**$695**
#RNB 14MR	Rack-Mt. PC, Motherboard Ready, **250W** (ATX version: **MX**)	**$500**

20-Slot PCI/ISA • Room for Three 3.5" & Two 5.25" Drives

#RNC 20	Rack-Mount PC, **20 ISA** Slots, **1 x 350W**, 7" High, 22" Deep	**$895**
#RNC 19P	Rack-Mt. PC, **19 PCI/ISA** Slots, **1 x 350W** (4 PCI/2 CPU/13 ISA)	**$995**
#RNA RS-xx	Rack Slides (**xx** – specify rack depth in inches; call for availability)	**$85**

20-Slot Quad PC • Room for Four 3.5" & Four 5.25" Drives

#RRA 2044	Rack-Mt. PC, **20 ISA** Slots, **300W**	**$1195**
#RRA 2044S20	Rack-Mt. PC, Segmentable **20 ISA** (5-5-5-5) Slots, **300W**	**$1295**
#RRA 2044DP16	Rack-Mt. PC, Segmented **16 PCI/ISA** (4-4-4-4), **300W**	**$1395**
#RRT RSL	Rack Slide Set: 18" Slides + 7" Extender (for 18" to 25" depths)	**$95**

Power Supply Upgrades: **#PSA 25300** 250W to 300W..**$50**; **#PSA 30400** 300W to 400W...**$150**
#PSA 25400 250W to 400W.....**$200** | **#PSA 30112** 300W to +12VDC/160W....**$200**
#PSA 25548 250W to –48VDC/250W ...**$250** | **#PSA 30524** 300W to +24VDC/250W....**$200**
#PSA 25348 250W to –48VDC/300W ...**$300** | **#PSA 30348** 300W to –48VDC/300W....**$250**

#MSI 21000C	1.6 GB (1600 MB) IDE Hard Drive (price with system only)	**$250**
#MSI CDI	5.25" CD-ROM Drive, IDE (24x Speed, minimum)	**$100**

IMPORTANT: All Passive-Backplane units require an All-in-One CPU Card (see pages 35-38 for details). For motherboard-based PCs see page 34.

Note: Each PC includes a 3.5" 1.44MB Floppy Drive. Popular Accessories: External Rack & Flat-Screen Monitors (pp. 12-15), Rack-Mt. Keyboards (pg. 41), & Hard Drives (pg. 43).

QUANTITY DISCOUNTS: 1-4/LIST 5-9/5% 10-24/10% 25-49/15%

Quantities of a Single Item Per Shipment – Call for Details

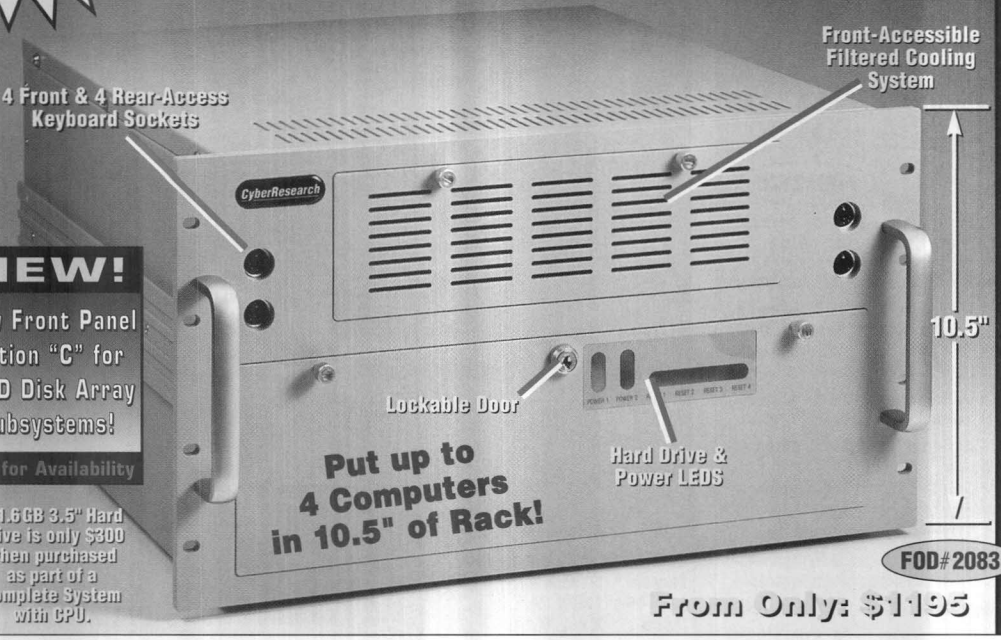
INDUSTRIAL RACK-MOUNT PCS WITH 20-SLOT PASSIVE BACKPLANES

CyberResearch Industrial Rack-Mount PCs

20-Slot Segmentable Passive Backplanes
(Up to 4 PC Systems in one Chassis)

BE$T VALUE!

RNT 2030/50/60 20-Slot Rack-Mount PC
with 1 x 300W or 2 x 300W Hot-Swap Power Supplies



NEW!
New Front Panel Option "C" for RAID Disk Array Subsystems!
Call for Availability

A 1.6GB 3.5" Hard Drive is only $300 when purchased as part of a complete System with CPU.

FOD#2083

From Only: $1195

RNT Series Rack-Mt PC
Offers a Choice of Easy to Configure Options:

❶ *Power Supply*
- Independent Supplies — 1 x 300W or 2 x 300W
- Hard-Swap 2 x 250W
- Hot-Swap 2 x 300W

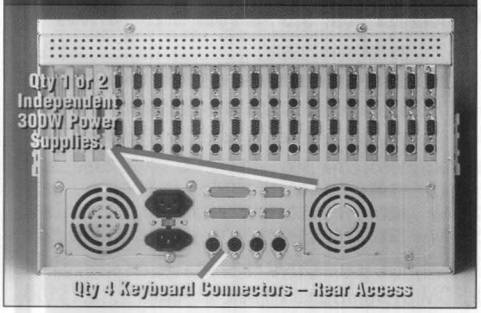
❷ *Front Panel*
- Standard Front Panel — 2 x 5.25" & 4 x 3.5" Drive Bays
- Optional "B" Front Panel — 4 x 5.25" & 2 x 3.5" Drive Bays

❸ *Passive Backplane*
- 20-Slot Segmentable ISA & PCI Models can support Multiple CPUs:
- 20-Slot: Quad ISA-Bus
- 19-Slot: Triple PCI/ISA Bus
- 18-Slot: Dual PCI/ISA Bus

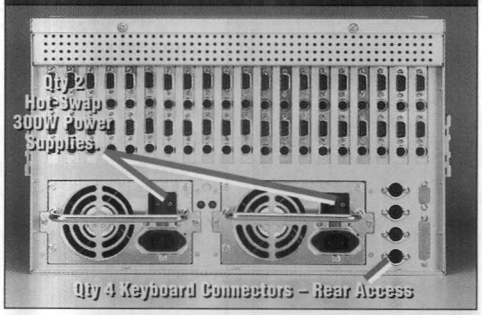
RNT 2030, RNT 2050 & RNTH 2060 Industrial Multi-CPU Rack-Mount PC Systems feature:

- **Rack Mount two-level industrial chassis.** Passive backplane with ISA and/or PCI slots on the **upper level** and the power supplies on the **lower level**. Hold-down clamp keeps cards in place. 19" **W**ide at flanges; only 10.5" **H**igh (6 RU); 18" **D**eep (483**W** x 266**H** x 456**D** mm). Weight: 36 lbs / 16.3 kg.
- **System Configuration:** Our **RNT Series** of Industrial Multi-CPU Rack-Mount PCs can support *up to four CPUs in the same chassis,* each of which can be operated independently and simultaneously to provide four computers in one rack-mount chassis. To configure a system, just select the **❶ Power Supply, ❷ Front Panel, & ❸ Passive Backplane** which best meet your needs. Use with Rack-Mount Monitors (pages 12-15) and Rack-Mount Keyboards shown on pages 40-41.
- **Front Panel:** Choice of two – the standard front panel features drive bays for **two 5.25"** Hard Drives (HDD), Floppy Drives (FDD), or CD-ROMs and a total of **six 3.5"** half-height HDD or FDDs. Optional **"B" Front Panel** features drive bays for **four 5.25", two 3.5"** (front-accessible), and **one 3.5"** (internal) drive bay. ***A 3.5" 1.44MB Floppy Drive is included with each chassis.*** **Locking Front Access Drive Bay Door** protects access to disk/power & reset controls section.
- **Power Supplies:** Choice of four power supplies from: **300W** to **Dual 300-Watt Hot-Swappable (600W total).** Supplies operate from 90-132 or 180-264VAC, at 47 to 63Hz. See below for details.
- **Passive Backplanes:** Choice of four Passive Backplanes with room for full-height/full-length adapter cards: **Standard** 20-Slot ISA, **S** 20-Slot Segmentable ISA, **SP19** 19-Slot Segmentable PCI/ISA, or the **SP18** 18-Slot Segmented PCI/ISA. Segmentable Backplanes (**S & SP19**) **can be easily segmented** via movable jumpers to accept two, three, or up to four CPUs (see facing page for details.)
- **All-in-One CPU Cards:** Multi-CPU Rack-Mount PCs with passive backplanes require from one to four All-in-One Pentium or '486 CPU cards – see pp. 36-38 for CPUs. Call for **Free** application assistance.
- **Locking Drive Bay Door on Front of Unit** protects access to drives, power & reset controls section.
- **Positive-Pressure Cooling via Four 86 CFM Fans** with fan filters (plus 2 power supply fans).
- **Operating Temperature:** 0 to +55°C (+32 to 131°F) **Relative Humidity:** 10-90%, non-condensing.
- **Vibration:** Sweeping freq: 5-35-200 Hz, 0.6mm amplitude (zero to peak).

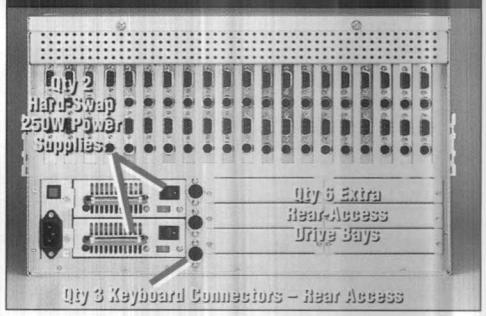
RNT 2030/60 Rack-Mt PC
with 1 x 300W or 2 x 300W Independent Power Supplies



RNTH 2060 Rack-Mt PC
with 2 x 300W Hot-Swap Power Supplies



RNT 2050 Rack-Mt PC
with 2 x 250W Hot-Swap Power Supplies



❶ Power Supply –
Select from four options:
- **#RNT 2030** comes with **One 300W** Power Supply.
- **#RNT 2060** comes with **Two 300W** Power Supplies (independent).

CE / TÜV / UL / CSA approvals.

- **#RNTH 2060** comes with **Two 300-Watt** Hot-Swappable Load-Sharing Redundant Power Supplies with zero transfer time.

Audible power supply failure alarm (buzzer). Front Panel LEDs and Alarm Reset Button (Hot-Swap units only).

- **#RNT 2050** comes with **Two 250W** Redundant Load-Sharing Power Supplies (power-down to Hard Swap). Unit features **six extra rear-access 3.5" drive bays.**

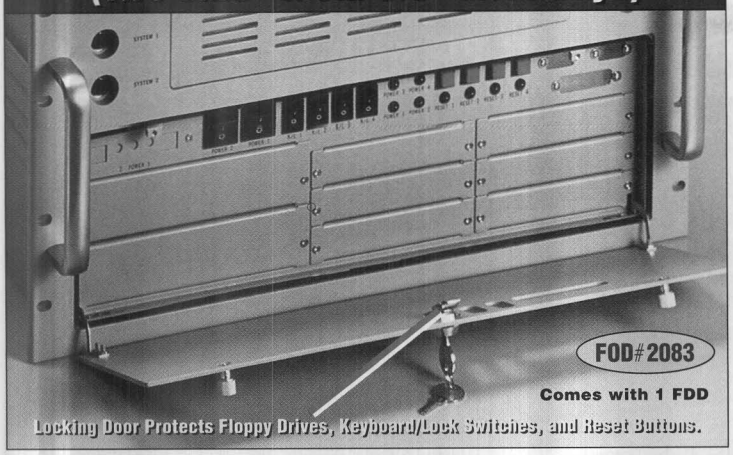
Purchase an Extra Hot Swap Power Module for Stand-By: only $300.

IMPORTANT: Don't Forget to Purchase an Extra Hot-Swappable Power Supply Module for Stand-by!
Call for Details FOD#2083

CyberResearch Assistance: Toll-Free 1-800-341-2525 (USA) ☎ Tel: 203-483-8815 Fax: 203-483-9024
Applications Engineers: Mon-Fri, 9 AM-5 PM U.S. Eastern Time • **Internet Website:** http://www.cyberresearch.com • **Fax-on-Demand System:** 203-483-9966 • **BBS:** 203-488-8949

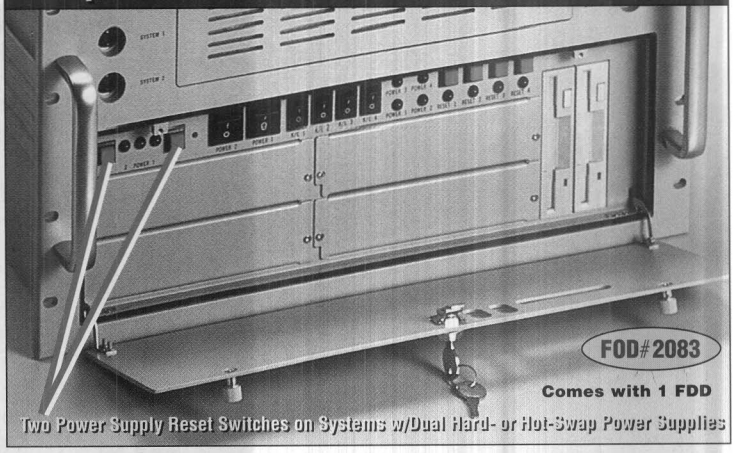
FAULT-TOLERANT INDUSTRIAL RACK-MOUNT PCs

RNT 2030/50/60 Rack-Mt PC with Standard Front Panel (two 5.25" & six 3.5" drive bays)



OR

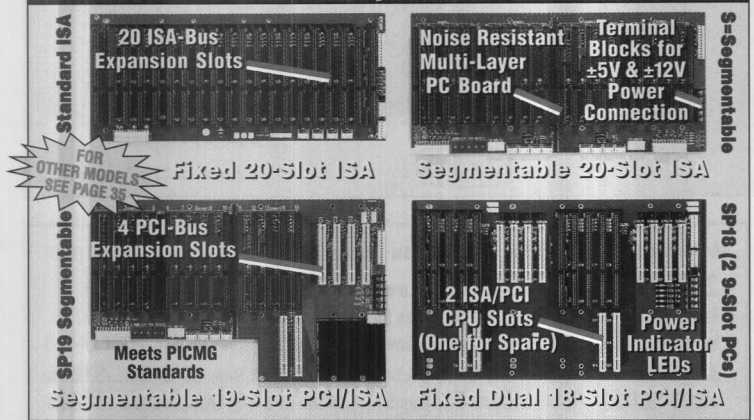
RNT 2030/50/60 Rack-Mt PC with Optional "B" Front Panel (four 5.25" & two 3.5" drive bays)



❷ **Front Panel** – Select either the **Standard Front Panel** w/two 5.25" & six 3.5" drive bays or the optional **"B" Front Panel** with four 5.25" & two 3.5" (plus one internal 3.5") drive bays.

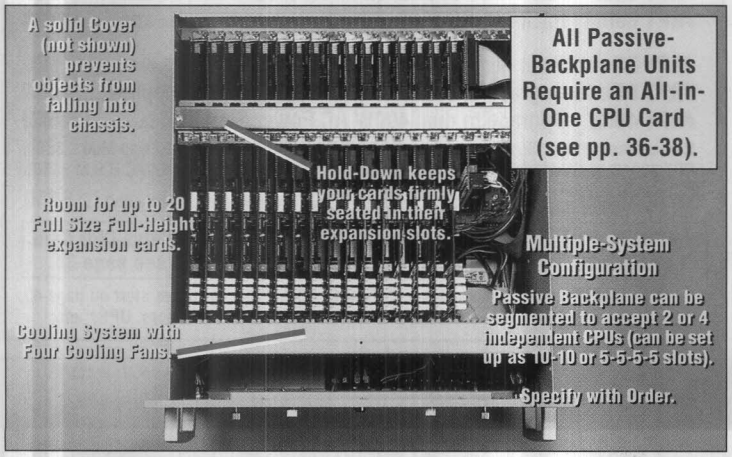
Multi-System Support for One, Two, Three, or Four CPUs. Front-accessible controls for multiple systems including: **2 Power On/Off Switches, 4 On/Off Power LED Indicators, 4 LED Hard Drive Indicators, 4 CPU Reset Buttons, 4 Keyboard/Lock Switches, & 4 Front + 4 Rear-Access Keyboard Sockets** *(RNT 2050 has only 3 Rear Kbd. Sockets).*

20-Slot Passive Backplanes • ISA or PCI/ISA



❸ **Passive Backplane** Select from four rugged ISA or PCI/ISA PICMG Passive Backplanes which can be easily segmented using built-in movable jumpers to accept one, two, three, or four independent CPUs.

- **20-Slot ISA** can accept 1 CPU & up to 19 ISA Full-Size Cards.
- **SP19 PCI/ISA** can accept up to 3 CPUs: 4**P**CI/2**C**PU/3**I**SA + 5**I** + 5**I** (3 CPUs); or 4**P**/2**C**/8**I** + 5**I** (2 CPUs), or 4**P**/2**C**/3**I** + 10**I** (2 CPUs); or 4**P**/2**C**/13**I** (1 CPU).
- **"S" 20-Slot Segmentable ISA** can accept 1, 2, 3, or 4 CPUs. ISA slots can be set up as 20, 10-10, 15-5, 10-5-5, or 5-5-5-5.
- **SP18 PCI/ISA** uses 2 CPUs: Has 18 slots (two 9-slot PCs); 2 x 4**P**CI/2**C**PU/3**I**SA slots.



All Passive-Backplane Units Require an All-in-One CPU Card (see pp. 36-38).

Ordering Information: **For additional info see Fax-on-Demand: FOD#2083**

20-Slot Rack-Mount PCs • Two-Level 10.5" High (6RU) x 18" Deep Rear-Access Power Supplies (power supplies accessible from rear of unit)

Available with choice of: **Front Panel (Version A: Qty 2 5.25" & Qty 6 3.5" Front Drive Bays, or Version B: Qty 4 5.25" & Qty 2 (+1 internal) 3.5" Drive Bays); Passive Backplane (ISA or PCI/ISA, Fixed or Segmentable); & Power Supplies (1 or 2 x 300W, 2 x 250W Hard-Swappable, or 2 x 300W Hot-Swappable).**

(NOT HOT-SWAP) Qty 1 x 300W or 2 x 300W Separate Power Supplies

#RNT 2030 Rack-Mt. PC, **20 ISA** Slots, **1x300W,** 10.5" High, 18" Deep.....**$1195**
#RNT 2030S Segmentable Rack-Mount PC, **20 ISA** Slots, **1x300W**.....**$1295**
#RNT 2030SP18 Seg. Rack PC, **18 PCI/ISA** Slots 2x4PCI/2CPU/3ISA, **1x300W** ..**$1395**
#RNT 2030SP19 Seg. Rack PC, **19 PCI/ISA** Slots 4PCI/2CPU/13ISA, **1x300W**..**$1395**
Change **2030S** suffix to **2060S** for model w/**2nd 300W Power Supply** (**S** & **SP19** only)....**$100**

(NOT HOT-SWAP) 2 x 250W Hard-Swap Redundant Power Supplies

#RNT 2050 Rack-Mt. PC, **20 ISA** Slots, **2x250W,** 10.5" High, 18" Deep.....**$1495**
#RNT 2050S Segmentable Rack-Mt. PC, **20 ISA** Slots, **2x250W**.....**$1595**
#RNT 2050SP18 Seg. Rack PC, **18 PCI/ISA** Slots 2x4PCI/2CPU/3ISA, **2x250W** ..**$1695**
#RNT 2050SP19 Seg. Rack PC, **19 PCI/ISA** Slots 4PCI/2CPU/13ISA, **2x250W**..**$1695**

(HOT-SWAP) 2 x 300W Hot-Swappable Redundant Power Supplies

#RNTH 2060 Rack-Mt. PC, **20 ISA** Slots, **2x300W,** 10.5" High, 18" Deep.....**$1595**
#RNTH 2060S Segmentable Rack-Mount PC, **20 ISA** Slots, **2x300W**.....**$1695**
#RNTH 2060SP18 Seg. Rack PC, **18 PCI/ISA** Slots 2x4PCI/2CPU/3ISA, **2x300W**...**$1795**
#RNTH 2060SP19 Seg. Rack PC, **19 PCI/ISA** Slots 4PCI/2CPU/13ISA, **2x300W**...**$1795**

Add **B** Suffix to RNT/RNTH series Part # for **Optional Front Panel Style B: Has Qty 4 5.25" & Qty 2 3.5" Drive Bays** (part# example: RNTH 2060S**B**)

Rack Slides: Add **R** to Part # (example: RNTH 2060SR).....**$85**
Replacement Hot-Swap Power Supply Module: add **HSM** to part# (ex: RNTH 2060HSM)..**$300**

***IMPORTANT:** **Passive-Backplane Units Require an All-in-One CPU Card (pp. 36-38).**

BEST BUYS in red. Note: Rack-Mount PCs include a 3.5" 1.44 MB Floppy Drive (FDD). We'll include a 3.5" 1.6 GB Hard Drive for only $250 when purchased as part of a complete System with CPU. Optional accessories start on page 40, including: RAM upgrades, floppy & hard drives, printers, rack-mount surge protectors, UPSs, etc. CPUs: pp. 36-38.

Don't Forget to Buy a Spare Hot-Swappable Power Supply: $300!!!

Quantity Discounts: 1-4/List 5-9/5% 10-24/10% 25-49/15% **Quantities of a Single Item Per Shipment – Call for Details**

Industrial Rack-Mount PCs with 8 to 20 Slot Passive Backplanes

CyberResearch Industrial Rack-Mount PCs 8 to 20 Slot with Hot-Swappable Redundant Power Supplies

Record-Breaking Price/Performance!

RPT 2060 20-Slot Rack-Mount PC with 2 x 300W FRONT-Access Hot-Swappable Redundant (HSR) Power Supplies

From Only: $1295!

FOD#2080

Comes with TWO 300W 115/230V Hot-Swappable Power Supplies!

Options: TWO 400W AC or TWO 250W –48V Hot-Swappable Power Supplies!

RPT 2060 20-Slot Rack-Mt PC System w/Front-Access 2x300W Hot Swap P.S. includes:

- **20-slot** PCI/SA-bus **passive backplane** w/ room for full-height/full-length plug-in cards.
- 19" **W**ide at flanges; only 8.75" **H**igh (5 RU); 25" **D**eep (483**W** x 222**H** x 635**D** mm). Wt: 50 lbs/22 kg.
- **Locking hinged door** protects access to disk drives, power supplies, & reset controls.
- **Drive Bay** for **THREE** Front-Accessible 5.25" Drives and **ONE** Internal 5.25" Hard Drive. ***A 1.44MB Floppy Disk Drive is included.***
- **Cooling provided by three 82 CFM Fans, plus two Power Supply Fans.**
- **Built-in Reset Switch,** two **LED Indicators**, (Power & HDD), and a **Power On/Off switch**.
- Use w/All-in-One Pentium or '486 CPU cards.
- Use with optional external **Rack-Mount SVGA Color CRT** or **Flat-Screen Monitors.**
- **Operating Temperature:** 0 to +40°C for Full Load, up to 55°C ½-Load. **Relative Humidity:** 8 to 85%, non-condensing.
- **FRONT-Access Dual 300-Watt Power Supply** — operates from 90-135VAC or 180-270VAC, at 47 to 63Hz. **600 Watts** total **Hot-Swap Redundant (HSR) Power Supply** via two independent **300-Watt Power Supplies**. Optional DC power supply available (Dual –48V DC/250W). **Replacement Supplies:** **RPT 300AC** 115/230VAC, 300W.....**$250** or **RPT 248DC** –48VDC, 250W.....**$500**.
- **Optional Multiple-System Configurations:** **#RPT 2060S** supports up to four independent 5-slot PC systems which can be operated simultaneously. The Passive Backplane of the **2060S** comes with 4 separated 5-slot sections designed to accommodate up to 4 independent CPUs.

Call our Fax-on-Demand System for additional info 203-483-9966: FOD#2080

RPT 860: 8-Slot PCI Rack-Mt. with REAR-Access 2x300W Hot-Swap P.S.

Hard Drive & Power Indicators — 6 Front Accessible *and* 2 Internal 5.25" drive Bays

Call for info on 7RU 20-Slot Model

FOD#2088

PCI/ISA-Bus: $1295 ISA-Bus: $1195

Motherboard-Ready Chassis: $1100

Ordering Information: **Call Fax-on-Demand: FOD#2080** (2060) & **2088** (860)

20-Slot Rack-Mount PCs • Low Profile 8.75" (5RU) x 25" Deep

Front-Access Hot-Swap Power Supplies (power supplies accessible from front of unit)
Includes 2x300W Hot-Swappable Redundant Power Supplies (400W or –48VDC optional)

#RPT 2060 Rack-Mt. PC, **20 ISA** Slots, 2x300W, 8.75" High, 25" Deep.....**$1295**
#RPT 2060S Rack-Mount PC, Segmented **20 ISA** (5-5-5-5) Slots, 2x300W..**$1395**
#RPT 2060P Rack-Mt. PC, **19 PCI/ISA** Slots 4 PCI/2 CPU/13 ISA, 2x300W..**$1495**
#RPT 2060SP Rk-Mt. PC, **18** (9+9) Slots SEGMENTED: 2 x 4 PCI/2 CPU/3 ISA, 2x300W..**$1495**

8-Slot Rack-Mount PCs • Low Profile 8.75" (5 RU) x 25" Deep

Rear-Access Hot-Swap Power Supplies (power supplies accessible from rear of unit)
Includes 2x300W Hot-Swappable Redundant Power Supplies (400W or –48VDC optional)

#RPT 860 Rack-Mt. PC, **8 ISA** Slots, 2x300W, 8.75" High, 25" Deep.....**$1195**
#RPT 860P Rack-Mt. PC, **8 PCI/ISA** Slots 3PCI/2 CPU/3 ISA, 2x300W.....**$1295**
#RPT 860M Rack-Mt. PC, Motherboard Ready, 2x300W (call for ATX).....**$1100**

#RPT RS-xx Rack Slides (**xx** – specify rack depth: 18/20/22/24"; call if deeper)..**$85**
#RPT DCU48 Upgrade to dual **–48VDC**/250W Power Supplies.....**$500**
#RPT 400U Upgrade to dual **400W AC** Power Supplies.....**$500**

Replacement Power Supply Modules: **RPT 248DC** –48VDC, 250W Hot-Swap Mod....**$500**; **RPT 300AC** 300W 115/230VAC H.S.M...**$250**; **RPT 400AC** 400W 115/230VAC H.S.M...**$500**

#MSI 21000C 1.6 GB (1600 MB) IDE Hard Drive (price w/system only).....**$250**

*IMPORTANT: All Passive-Backplane Units Require an All-in-One CPU Card. See pages 36-38 for details. For Motherboard-based PCs see page 34.

Note: All Rack-Mount PCs include a 3.5" 1.44MB FDD. PC accessories start on page 40, including: hard drives, rack-mount keyboards, printers, surge protectors, UPSs, etc.

RPT 860 8-Slot Rack-Mt. PC System w/REAR-Access 2x300W Hot-Swap P.S. includes:

- **8-slot** PCI/SA-bus **passive backplane** with room for full-height/full-length plug-in cards.
- 19" **W**ide at flanges; only 8.75" **H**igh (5 RU); 25" **D**eep (483**W** x 222**H** x 635**D** mm). Weight: 50 lbs/22 kg.
- **Cooling provided by two 82 CFM Fans, plus two Power Supply Fans.**
- **Drive Bay** for **SIX** Front-Accessible 5.25" Drives *and* **TWO** Internal 5.25" Hard Drives. ***A 1.44MB Floppy Drive is included with unit.*** (ATX version: **RPT 860MX**, call for pricing).

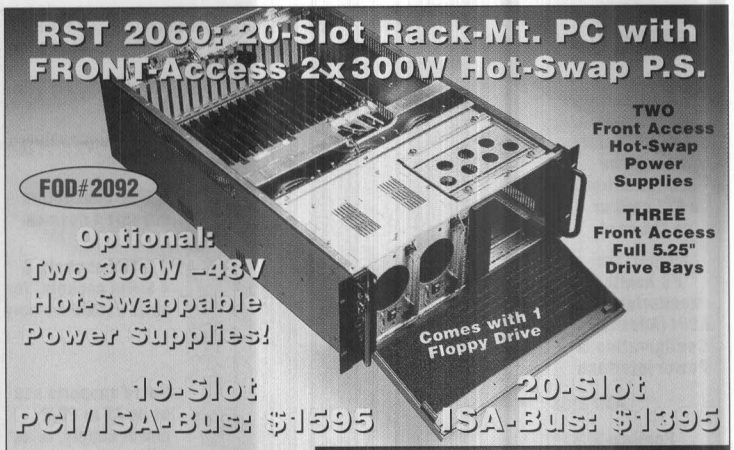
CyberResearch Assistance: Toll-Free 1-800-341-2525 (USA) Tel: 203-483-8815 Fax: 203-483-9024
Applications Engineers: Mon-Fri, 9 AM-5 PM U.S. Eastern Time • **Internet Website:** http://www.cyberresearch.com • **Fax-on-Demand System:** 203-483-9966 • **BBS:** 203-488-8949

RST 862/2060: 8 or 20-Slot Rack-Mt. PC with Hot-Swap Redundant (HSR) Power Supply

Premium Model
Ultra Low Profile
Only 7" High (4RU)

with TWO 300W HSR Power Supplies

RST 2060: 20-Slot Rack-Mt. PC with FRONT-Access 2x300W Hot-Swap P.S.



FOD#2092

Optional: Two 300W –48V Hot-Swappable Power Supplies!

TWO Front Access Hot-Swap Power Supplies

THREE Front Access Full 5.25" Drive Bays

Comes with 1 Floppy Drive

19-Slot PCI/ISA-Bus: $1595

20-Slot ISA-Bus: $1395

RST 862: 8-Slot Rk-Mt REAR-Access 2x300W

FOD#2086

Comes with 1 Floppy Drive

TWO Rear Access Hot-Swap Power Supplies

FIVE Front Access Full 5.25" Drive Bays

From: $1200

RST 2060 (20-slot) and RST 862 (8-slot) Rack-Mount PC Systems with 2x300W Hot-Swap Redundant Power Supplies include:

- **20 & 8-slot** PCI/SA-bus **passive backplanes** with room for full-height/full-length plug-in cards. Clamps help secure full-length cards.
- 19" **W**ide at Flanges; only 7" **H**igh (4 RU); 26" **D**eep (RST 2060) 19.25" **D**eep (RST 862) (483**W**x178**H**x660/489**D** mm). Wt: 33 lbs (15 kg).
- **Locking door** protects access to disk/power reset controls section.
- **Drive Bay** can accommodate **three** (RST 2060) **or five** (RST 862) front-accessible 5.25" Hard Disk/CD-ROM Drives or other devices. ***A 1.44MB Floppy Disk Drive (FDD) is included with each unit.***
- Use w/All-in-One Pentium/486 CPU cards. Motherboard: RST 862M only.
- **Cooling provided by three 90CFM cooling fans** (on RST 2060, or one 90CFM fan on RST 862)**, plus the two power supply fans.**
- **Dual 300-Watt Power Supply** — operates from 90-135VAC or 180-270VAC, at 47 to 63Hz. **600 Watts** total **Hot-Swappable Redundant (HSR) Power Supply** via two independent **300-Watt Power Supplies**. Dual 300W, –48VDC power supplies (600W total) available (factory upgrade – see below for pricing, call for information).
- **Optional ISA, PCI/ISA, or Motherboard (see pages 34-38).**
- **Built-in Reset Switch,** two **LED Indicators,** and one **Power On/Off switch. Keyboard sockets** located in both front *and* rear.
- **Operating Temp:** 0 to +50°C; **Rel. Humidity:** 5-95%, non-condensing.
- Use with **optional Rack-Mount Keyboards and SVGA Color Monitors – see pages 12-15 & 40-43.**

RRT 2060H 20-Slot Rack-Mt. PC with Hot-Swappable Redundant (HSR) Power Supply

Multiple-Systems
RRT 2060SH/2060PH
Passive Backplanes can be segmented easily using movable jumpers.

- **2060SH** can accept 2, 3, or 4 independent CPUs. ISA slots can be set up as 20, 10-10, 15-5, 10-5-5, or 5-5-5-5.
- **2060PH** PCI/ISA can accept up to 3 CPUs: 4PCI/2**C**PU/3ISA+5I+5I; or 4P/2**C**/8I+5I, or 4P/2**C**/3I+10I (2 CPUs); or 4P/2**C**/13I (1 CPU).

See pg. 35 for other possibilities.

Comes with 1 3.5" Floppy Drive

EIGHT Full 5.25" Drive Bays

18 LEDs
4 Reset Buttons
4 Keyboard Plugs
2 Power Switches

FOD#2016

Rear-Accessible Hot-Swap Power Supplies

From only: $1495

RRT 2060H Rack-Mt. PC System includes:

- **20-slot** ISA-bus **passive backplane** with room for full-height/full-length cards. Hold down clamp keeps plug-in cards firmly seated.
- 19" **W**ide at Flanges; only 10.5" **H**igh (6 RU); 23.3" **D**eep (483**W**x266**H**x592**D** mm).
- **Dual 300-Watt Power Supply** — operates from 90-135VAC or 180-270VAC, at 47 to 63Hz. **600 Watts** total **Hot-Swappable Redundant (HSR) Power Supply** via two independent 300-Watt Power Supplies.
- ***3.5" 1.44MB Floppy Drive included w/unit.*** Room for a total of eight **5.25"** devices.
- **Locking door** protects access to disk/power/reset controls section.
- Use w/All-in-One Pentium or '486 CPU cards.
- Rugged steel chassis is arranged in two levels. The 20-slot passive backplane is located on the **upper level** and the disk drive bay and power supplies are located on the **lower level**.
- A heavy duty **Push-Pull Positive-Pressure Cooling System with three Fans.**
- Backplane in the **RRT 2060SH can be easily segmented** to accept 2, 3, or 4 CPUs.
- **Keyboard sockets** located in both front *and* rear.
- **Operating Temp:** +32 to +112°F (0 to +50°C) **Relative Humidity:** 5-90%, non-condensing.
- Use with optional external **Rack-Mt. SVGA CRT** or **Flat-Screen Monitors.**

QUANTITY DISCOUNTS: 1-4/LIST 5-9/5% 10-24/10% 25-49/15%

Quantities of a Single Item Per Shipment – Call for Details

IMPORTANT: Don't Forget to Purchase an Extra Hot-Swap Power Supply Module for Stand-by! Call for Details

Ordering Information: **Fax Info: FOD#2092** (2060); **#2086** (862); **#2016** (2060H)

20-Slot Rack-Mount PCs • Low Profile 7" (4RU) x 26" Deep

Front-Access Hot-Swap Power Supplies (power supplies accessible from front of unit)
Includes 2x300W Hot-Swappable Redundant Power Supplies (–48VDC supplies optional)

#RST 2060	Rack-Mount PC, **20 ISA** Slots, 2x300W Power Supplies	$1395
#RST 2060S	Rack-Mount PC, Segmented **20 ISA** (5-5-5-5) Slots, 2x300W	$1495
#RST 2060P	Rack-Mt. PC, **19 PCI/ISA** Slots 4 PCI/2 CPU/13 ISA, 2x300W	$1595
#RST 2060SP	Rk-Mt. PC, **18** (9+9) Slots SEGMENTED: 2x4 PCI/2 CPU/3 ISA, 2x300W	$1595

20-Slot Rack-Mount PCs • Low Profile 7" (4RU) x 19.3" Deep

Rear-Access Hot-Swap Power Supplies (power supplies accessible from rear of unit)
Includes 2x300W Hot-Swappable Redundant Power Supplies (–48VDC supplies optional)

#RST 862	Rack-Mt. PC, **8 ISA** Slots, 2x300W Power Supplies	$1295
#RST 862P	Rack-Mt. PC, **8 PCI/ISA** Slots, 3 PCI/2 CPU/3 ISA, 2x300W	$1395
#RST 862M	Rack-Mt. PC, **8 PCI/ISA** Slots, Motherboard Ready, 2x300W	$1200
#RST RS-xx	Rack Slides (**xx** – specify rack depth: 18/20/22/24"; call if deeper)	$85
#RST DCU48	Upgrade to dual **–48VDC**/250W Power Supplies	$500
#RST 248DC	Replacement Hot-Swap Power Supply Module: –48VDC/250W	$500
#RST 300AC	Replacement Hot-Swap Power Supply Mod: 120/240VAC, 300W	$300

20-Slot Rack-Mount PCs • Two-Level 10.5" (6RU) x 23.3" Deep

Rear-Access Hot-Swap Power Supplies (power supplies accessible from rear of unit)
Includes 2x300W Hot-Swappable Redundant Power Supplies (400W supplies optional)

#RRT 2060H	Rack-Mount PC, **20 ISA** Slots, 2x300W Power Supplies	$1495
#RRT 2060PH	Rack-Mount, **19 PCI/ISA** Slots 4 PCI/2 CPU/13 ISA, 2x300W	$1695
#RRT 2060SH	Rack-Mt., Segmentable **20 ISA** Slots (see box at left), 2x300W	$1595
#RRT 400U	Upgrade to dual **400W AC** Power Supplies	$Call
#RRT 300AC	Replacement Hot-Swap Power Supply Module: 300W	$300
#RRT RSL	Rack Slide Set: 18" Slides + 7" Extender (for 18" to 25" depths)	$95
#MSI 21000C	1.6 GB (1600 MB) IDE Hard Drive (price w/system only)	$250
#MSI CDI	5.25" CD-ROM Drive, IDE (24x Speed, minimum)	$100

***IMPORTANT: All Passive-Backplane units require an All-in-One CPU Card. See pages 36-38 for details. For motherboard-based PCs see page 34.**

Note: All Rack-Mount PCs include a 3.5" 1.44MB FDD. PC accessories start on page 40, including: hard drives, rack-mount keyboards, printers, surge protectors, UPSs, etc.

MBPB Pentium/Pentium MMX Motherboard

MXPK Dual Pentium II Motherboard w/SCSI Wide

LATE BREAKING NEWS!

New Motherboard CPUs

Single & Dual Pentium PRO, Single & Dual Pentium II, & On-Board SCSI Ultra Wide!

***Important:* Motherboard-Ready & Passive Backplane PCs require a Motherboard or an All-in-One CPU Card – call for assistance.**

- **MR** (AT), **MB** (Baby AT), or **MX** (ATX) motherboard-ready models can be used with matching **Pentium** or **'486**-based motherboards.

See Motherboard-Ready Chassis listed below.

- ***Industrial Workstations*** *with built-in monitors will require one PCI or ISA slot for the display adapter.*
- ***Intel Pentium PRO*** *CPU includes 256K cache (built-in to the CPU). Call for details on optional 512K built-in cache.*
- *Our **MB** series motherboards are Baby AT size, designed to fit in our MR chassis.*
- *Our **MF** series motherboards are Full AT size, and may not fit in smaller chassis.*
- *Our **MX** series motherboards are **ATX-style motherboards,** designed for installation in ATX-compatible computer chassis, with ATX power supplies.*
- ***SCSI Ultra Wide*** *is available on some models via an on-board Adaptec 2940UW controller. It has connectors to support both SCSI-II (50-pin, narrow) & SCSI-3 (68-pin, wide) devices.*
- ***AGP:*** *Accelerated Graphics Port.*

FREE System Assembly. Call for Details.

CyberResearch Motherboards with CPU

Includes RAM & MS-DOS, order with Motherboard-Ready Chassis

CyberResearch Motherboards

Each comes with 16 or 32MB of RAM & MS-DOS Software. **Call for Quantity Discounts!**

	Microprocessor	Processor Speed (MHz)	System Memory (RAM) Included in Package Price Only	Maximum Memory	Memory Sockets (# of SIMMs) (# of DIMMs)	Mem. Socket Type (# of pins)	Cache Size (on Motherboard)	Maximum Cache Size	BIOS Type	RS-232 Serial Ports	Enhanced Parallel Port (EPP) (ECP)	USB Universal Serial Bus	PS/2 Mouse Port	EIDE Device Capacity	Floppy Controller Capacity	SCSI Ultra Wide (Adaptec 2940UW)	Intel Pentium Chipset	Operating Temperature	"Green PC" Power Mgmt.	Total # of Expansion Slots	PCI Slots	ISA Slots	PCI or ISA Slots (use for either)	AGP Slots (ultra-fast video bus)	Package Price with MS-DOS & Memory (RAM)
#MBPA 486-100	486DX/4-100	100MHz	16MB	128MB	4S	72	256KB	512KB	Award	2	Y	–	–	4	2	N	N/A	0 to 55°C	Y	7	3	3	1	0	**$495** w/16MB
#MBPA 486-133	486DX/5-133	133MHz	16MB	128MB	4S	72	256KB	512KB	Award	2	Y	–	–	4	2	N	N/A	0 to 55°C	Y	7	3	3	1	0	**$545** w/16MB
#MBPB PEN-100	Intel® Pentium	100MHz	32MB	256MB	4S & 2D	72 & 168	512KB	512KB	AMI	2	Y	2	Y	4	2	N	430TX	0 to 55°C	Y	7	3	3	1	0	**$645** w/32MB
#MBPB PEN-133	Intel® Pentium	133MHz	32MB	256MB	4S & 2D	72 & 168	512KB	512KB	AMI	2	Y	2	Y	4	2	N	430TX	0 to 55°C	Y	7	3	3	1	0	**$745** w/32MB
#MBPB PEN-166	Intel® Pentium	166MHz	32MB	256MB	4S & 2D	72 & 168	512KB	512KB	AMI	2	Y	2	Y	4	2	N	430TX	0 to 55°C	Y	7	3	3	1	0	**$795** w/32MB
#MBPB PEN-200	Intel® Pentium	200MHz	32MB	256MB	4S & 2D	72 & 168	512KB	512KB	AMI	2	Y	2	Y	4	2	N	430TX	0 to 55°C	Y	7	3	3	1	0	**$895** w/32MB
#MBPB PMX-166	**Pentium MMX**	166MHz	32MB	256MB	4S & 2D	72 & 168	512KB	512KB	AMI	2	Y	2	Y	4	2	N	430TX	0 to 55°C	Y	7	3	3	1	0	**$795** w/32MB
#MBPB PMX-200	**Pentium MMX**	200MHz	32MB	256MB	4S & 2D	72 & 168	512KB	512KB	AMI	2	Y	2	Y	4	2	N	430TX	0 to 55°C	Y	7	3	3	1	0	**$995** w/32MB
#MBPB PMX-233	**Pentium MMX**	233MHz	32MB	256MB	4S & 2D	72 & 168	512KB	512KB	AMI	2	Y	2	Y	4	2	N	430TX	0 to 55°C	Y	7	3	3	1	0	**$1195** w/32MB
#MBPC PRO-200	**Pent. Pro** Cache: **256K**	200MHz	32MB	768MB	6S	72	512KB	512KB	AMI	2	Y	2	N	4	2	N	440FX	0 to 55°C	Y	8	4	3	1	0	**$1395** w/32MB
#MBPD PR2-200	**Dual P. Pro** Cache: **256K**	2x200MHz	32MB	768MB	6S	72	512KB	512KB	AMI	2	Y	2	N	4	2	N	440FX	0 to 55°C	Y	6	3	2	1	0	**$2395** w/32MB
#MBPE PII-233	**Pentium II**	233MHz	32MB	768MB	6S	72	512KB	1024KB	AMI	2	Y	2	Y	4	2	N	440FX	0 to 55°C	Y	8	4	3	1	0	**$1395** w/32MB
#MBPE PII-266	**Pentium II**	266MHz	32MB	768MB	6S	72	512KB	1024KB	AMI	2	Y	2	Y	4	2	N	440FX	0 to 55°C	Y	8	4	3	1	0	**$1695** w/32MB
#MBPE PII-300	**Pentium II**	300MHz	32MB	768MB	6S	72	512KB	1024KB	AMI	2	Y	2	Y	4	2	N	440FX	0 to 55°C	Y	8	4	3	1	0	**$1995** w/32MB
#MXPG PII-233	**Pentium II**	233MHz	32MB	768MB	3D	168	512KB	1024KB	AMI	2	Y	2	Y	4	2	N	440LX	0 to 55°C	Y	7	3	2	1	1	**$1395** w/32MB
#MXPH PII-233	**Pentium II**	233MHz	32MB	1024MB	4D	168	512KB	1024KB	AMI	2	Y	2	Y	4	2	Y	440LX	0 to 55°C	Y	7	3	2	1	1	**$1595** w/32MB
#MFPJ PII2-233	**Dual Pent. II**	2x233MHz	32MB	1024MB	8S & 4D	72 & 168	512KB	1024KB	AMI	2	Y	2	Y	4	2	N	440LX	0 to 55°C	Y	8	4	2	1	1	**$2495** w/32MB
#MFPJ PII2-300	**Dual Pent. II**	2x300MHz	32MB	1024MB	8S & 4D	72 & 168	512KB	1024KB	AMI	2	Y	2	Y	4	2	N	440LX	0 to 55°C	Y	8	4	2	1	1	**$3695** w/32MB
#MXPK PII2-233	**Dual Pent. II**	2x233MHz	32MB	1024MB	4D	168	512KB	1024KB	AMI	2	Y	2	Y	4	2	Y	440LX	0 to 55°C	Y	7	3	2	1	1	**$2695** w/32MB

Total System Price = Base price of the Motherboard-Ready (MR) Chassis + Price of the Motherboard. **See page 39.**

Motherboard-Ready Chassis

		Cost	Pp.
#VRK MR	Rack-Mt. w/10" VGA Color + Keybd.	**$3300**	16
#VTK MR	Rack-Mt. w/10" VGA + Trackball Kbd.	**$3450**	16
#VRC MR	Rack-Mt. w/10" VGA Color CRT	**$1700**	17
#MRV MR	Rack-Mount w/10" Mono VGA CRT	**$1200**	17
#RPC MR	Rack-Mt. Chassis w/8 Drive Spaces	**$600**	17
#N4W 14TMR	Rack-Mt. w/TFT Color LCD Display	**$3200**	18
#NWC 8TMR	Rack-Mt. w/TFT Color LCD Display	**$2900**	20
#N1R 14TMR	Rack-Mt. w/TFT Color LCD Display	**$2800**	21
#RWL MR	Rack-Mt. w/TFT Color LCD Display	**$3200**	21
#MB IPC10XM	MicroBox Compact Chassis	**$485**	24
#MB 8TM/TMX	Desktop Tower, select AT or ATX	**$195**	25
#MB 8DM/DMX	Desktop Chassis, select AT or ATX	**$195**	25
#RPA MB/MX	Rack-Mt. Chassis, select AT or ATX	**$500**	26
#N1C 14MR	Rack-Mt. Chassis w/4 Drive Spaces	**$500**	26
#N1D 14MR	Rack-Mt. Chassis w/6 Drive Spaces	**$700**	26
#N1A 14MR/MX	Rack-Mt. Chassis, select AT or ATX	**$600**	27
#RRB MB/MX	Rack-Mt. Chassis, select AT or ATX	**$650**	27
#RNA 14MR/MX	Rack-Mt. Chassis w/5 Drive Spaces	**$400**	28
#RNB 14MR/MX	Rack-Mt. Chassis w/2 Drive Spaces	**$500**	28
#RPT 860M/MX	Rack-Mt. Chassis, select AT or ATX	**$1100**	32
#RST 862M	Rack-Mt. Chassis w/5 Drive Spaces	**$1200**	33

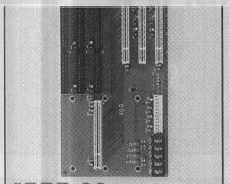
NOTE: Use **MX** versions for **MX**-series motherboards. Call for info.

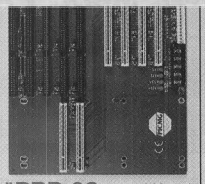
Memory & DOS Included FREE

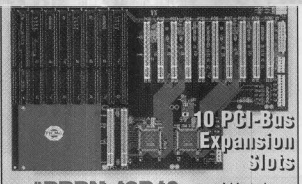
Our motherboards come ready-to-use, with both memory (32MB of RAM on all Pentium models, and 16MB with the 486-based boards), and Microsoft DOS. We'll install your complete system into a CyberResearch Motherboard-Ready Chassis (**MR, MB** or **MX**), and test it before shipping it to your site.

CyberResearch Assistance: Toll-Free 1-800-341-2525 (USA) ☎ **Tel: 203-483-8815 Fax: 203-483-9024**

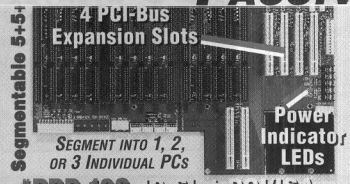
Applications Engineers: Mon-Fri, 9AM-5PM U.S. Eastern Time • **Internet Website:** http://www.cyberresearch.com • **Fax-on-Demand System:** 203-483-9966 • **BBS:** 203-488-8949


#PBP 06 PCI/ISA

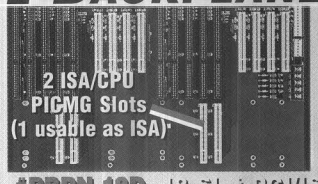

#PBP 08 PCI/ISA



#PBPN 19P10 PCI/ISA



#PBP 19S 19-Slot PCI/ISA



#PBPN 18D 18-Slot PCI/ISA

CyberResearch Passive Backplanes — Require an All-in-One CPU Card (Pg. 36-38) to use as a Stand-Alone PC — See Fax-on-Demand for Details

Part Number	Slots	FOD#	PC Board	Type	ISA Slots	CPU Slots Ⓐ	PCI Slots	Notes:	Mounting Dim. (WxH)		Price
#PBI 03	3 Slots	2661	2-Layer	ISA	3	–	–	–	2.83x7.48"	72x190mm	$65
#PBI 04	4 Slots	2661	4-Layer	ISA	4	–	–	–	3.54x6.69"	90x170mm	$60
#PBI 05	5 Slots	2661	4-Layer	ISA	5	–	–	–	4.31x6.89"	109x175mm	$75
#PBI 06	6 Slots	2661	4-Layer	ISA	6	–	–	–	5.31x6.89"	135x175mm	$70
#PBI 07	7 Slots	2661	4-Layer	ISA	7	–	–	–	5.91x6.89"	150x175mm	$80
#PBI 08	8 Slots	2661	4-Layer	ISA	8	–	–	–	8.58x6.89"	218x175mm	$85
#PBIN 10	10 Slots	2661	4-Layer	ISA	10	–	–	–	8.63x6.93"	219x176mm	$95
#PBIR 10D	10 Slots	2661	4-Layer	ISA	5/5	–	–	2 PCs (5/5) ⒹⒺ	8.84x6.89"	224x175mm	$125
#PBI 12	12 Slots	2661	4-Layer	ISA	12	–	–	–	10.9x7.16"	277x182mm	$95
#PBI 14	14 Slots	2661	4-Layer	ISA	14	–	–	–	12.2x6.85"	310x174mm	$100
#PBIR 14D	14 Slots	2661	4-Layer	ISA	6/8	–	–	2 PCs (6/8) ⒹⒺ	11.0x6.90"	280x175.3mm	$150
#PBI 20	20 Slots	2661	4-Layer	ISA	20	–	–	–	16.4x7.0"	416x180mm	$200
#PBIN 20D	20 Slots	2661	4-Layer	ISA	10/10	–	–	2 PCs (10/10) ⒹⒺ	16.5x7.5"	418x190mm	$250
#PBI 20S	20 Slots	2661	4-Layer	ISA	5+5+5+5	–	–	1 to 4 PCs ⒸⒻ	16.4x7.8"	417x200mm	$300
PICMG Standard (PCI Industrial Computers Manufacturers Group) **PCI/ISA Passive Backplanes for use with PCI/ISA CPU Cards** (CPUs: PP. 36-38)											
#PBP 04	4 Slots	2672	PICMG	PCI/ISA	0	1	3		3.71x10.4"	94x264mm	$120
#PBP 05H	5 Slots	2325	SPECIAL	PCI/ISA	1	1Ⓖ	3	See page 23Ⓖ	5.24x7.09"	133x180mm	$125
#PBP 05	5 Slots	2672	PICMG	PCI/ISA	2	1	2		4.33x10.0"	110x254mm	$130
#PBP 06	6 Slots	2672	PICMG	PCI/ISA	2	1	3		5.91x10.4"	150x264mm	$125
#PBP 07	7 Slots	2672	PICMG	PCI/ISA	3	1	3		5.91x10.4"	150x264mm	$130
#PBP 08	8 Slots	2672	PICMG	PCI/ISA	3Ⓐ	2	3		8.74x10.1"	222x257mm	$135
#PBPR 08P6	8 Slots	2672	PICMG	PCI/ISA	1	1	6	Use w/V2.1 CPUⒷ	8.58x10.4"	218x265mm	$300
#PBPN 10	10 Slots	2672	PICMG	PCI/ISA	4Ⓐ	2	4		8.74x10.1"	222x257mm	$140
#PBPR 10P7	10 Slots	2672	PICMG	PCI/ISA	1Ⓐ	2	7	Use w/V2.1 CPUⒷ	8.74x10.4"	222x265mm	$350
#PBPN 12	12 Slots	2672	PICMG	PCI/ISA	6Ⓐ	2	4		10.9x10.1"	277x257mm	$150
#PBPN 13D	13 Slots	2672	PICMG	PCI/ISA	1/1Ⓐ	2/2	4/3	2 PCs (7/6) ⒹⒽ	12.5x10.3"	318x261mm	$275
#PBP 13L	13 Slots	2672	PICMG	PCI/ISA	7Ⓐ	2	4 (on Left)	PCI slots on end opposite from the PC power supply.	12.3x10.4"	311x264mm	$225
#PBP 14	14 Slots	2672	PICMG	PCI/ISA	8Ⓐ	2	4		12.5x10.1"	317x257mm	$200
#PBPN 14P7	14 Slots	2672	PICMG	PCI/ISA	5Ⓐ	2	7	Use w/V2.1 CPUⒷ	12.5x10.2"	317x257mm	$400
#PBPN 16D	16 Slots	2672	PICMG	PCI/ISA	0/0/0/0Ⓐ	2/2/2/2Ⓙ	3/3/3/3Ⓙ	4 PCs (4/4/4/4) ⒹⒿ	16.4x10.25"	416x261mm	$400
#PBPN 18D	18 Slots	2672	PICMG	PCI/ISA	3/3Ⓐ	2/2	4/4	2 PCs (9/9) ⒹⓀ	16.4x10.2"	416x260mm	$400
#PBP 19S	19 Slots	2672	PICMG	PCI/ISA	5+5+3Ⓐ	0+0+2	0+0+4	1 to 3 PCs ⒸⓁ	16.4x10.2"	417x260mm	$400
#PBPR 19P7	19 Slots	2672	PICMG	PCI/ISA	10Ⓐ	2	7	Use w/V2.1 CPUⒷ	16.4x10.4"	416x265mm	$450
#PBPN 19P10	19 Slots	2672	PICMG	PCI/ISA	7Ⓐ	2	10	Use w/V2.1 CPUⒷ	16.4x10.25"	416x261mm	$500

Ⓐ Unused **CPU Slots** may be used as ISA expansion slots.

Ⓑ Several backplanes incorporate 21152 PCI-to-PCI Bridge chip(s). Use an All-in-One CPU card which supports PCI Local Bus Spec. V2.1 to ensure compatibility. Call for details.

Ⓒ **Segmentable Passive Backplanes** can be easily segmented using built-in movable jumpers to accept one, two, three, or four independent CPUs.

Ⓓ **Segmented Passive Backplanes** are designed to accept a fixed number of independent CPU cards, providing a fixed number of slots for each CPU.

Ⓔ These **Segmented (10, 14, & 20-Slot)** models are built for 2 CPUs. Slots are set up as 5-5, 6-8, or 10-10, respectively (i.e. in the 5-5, there are 5 slots for each of the 2 PCs).

Ⓕ **20-Slot Segmentable ISA** can use 1, 2, 3, or 4 CPUs. Slots can be set up as 20, 10-10, 15-5, 10-5-5, or 5-5-5-5.

Ⓖ Please see **MB IPC5NHP** on page 23 for additional info on **#PBP 05H**.

Ⓗ **13-Slot Segmented PCI/ISA** is built for 2 CPUs. Slots are set up as 1ISA/2CPU/4PCI + 1ISA/2CPU/3PCI.

Ⓙ **16-Slot Segmented PCI/ISA** is built for 4 CPUs (four 4-slot PCs). It's set up as 4 independent systems, each of which can provide 3PCI+1CPU or 2PCI+1CPU+1ISA. See photo and notes Ⓐ & Ⓓ above.

Ⓚ **18-Slot Segmented PCI/ISA** is built for 2 CPUs (two 9-slot PCs). Set up as 2 x 4 PCI/2 CPU/3 ISA slots.

Ⓛ **19-Slot Segmentable PCI/ISA** can use up to 3 independent CPUs: 5ISA + 5ISA + 4PCI/2CPU/3ISA (3 CPUs); or 5ISA + 4PCI/2CPU/8ISA (2 CPUs), or 10ISA + 4PCI/2CPU/3ISA (2 CPUs); or 4PCI/2CPU/13ISA (1 CPU).

See All-in-One CPUs Next 3 Pages ☛

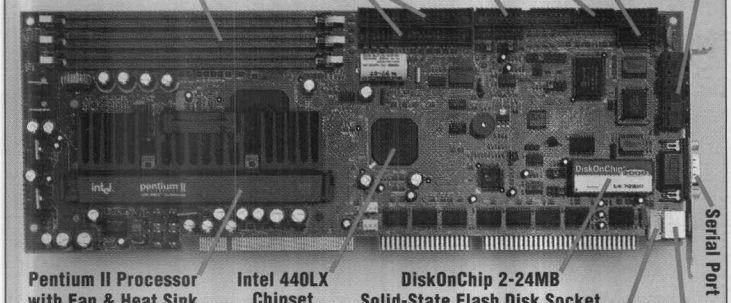
QUANTITY DISCOUNTS: 1-4/LIST 5-9/5% 10-24/10% 25-49/15% Quantities of a Single Item Per Shipment – Call for Details

ALL-IN-ONE CPU CARDS w/INTEL PENTIUM CPUs: PENTIUM, MMX, PRO, & II

NEW!

#CPRM PII-xxx — FOD#2642

Available with 233, 266, or 300MHz Pentium II Microprocessor



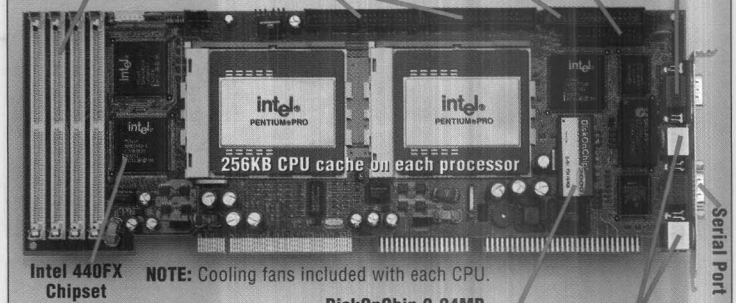
NOTE: The height (2.7") of the Pentium II processor may cause it to partially obstruct adjacent slots.

Pentium II All-in-One CPU Card with SoundBlaster 16 Audio Interface and DiskOnChip®

NEW!

#CPRL PR2-200 — FOD#2641

Comes complete with Two 200MHz Pentium Pro Microprocessors



NOTE: Cooling fans included with each CPU.

Dual Pentium Pro All-in-One CPU Card with socket for DiskOnChip® Solid-State Flash Disk

CyberResearch All-in-One CPU Cards

Part Number includes RAM & MS-DOS Add the SUFFIX "-C" for CPU Card Only.

CyberResearch Industrial All-in-One CPU Cards

Either with 32MB RAM & MS-DOS, or Card only. Call for Quantity Discounts!

#CPxx-xxx	Microprocessor	System Memory (RAM) (Included in Package Price Only)	Maximum Memory	High-Speed RAM Cache	On-Board SVGA	Video RAM Included	SCSI Controller	Built-in PC/104 Expansion Bus	RS-232 Serial Ports	Parallel Printer Port (SPP)	Chip Set	Special Features	Operating Temperature	Card Length/Bus	Fax-on-Demand FOD#	Package w/32MB & DOS (Card w/CPU only: Deduct $150) 166 MHz	200 MHz	233 MHz	266 MHz	300 MHz
CPLD PMX-xxx	Pent. MMX	32MB	128MB	512K	–	–	–	Y	2Ⓐ	Y	430VX	Ⓓ	0 to 55°C	Full PCI	**2631**	**$995**	**$1195**	**$1395**	–	–
CPLE PMX-xxx	Pent. MMX SVGA	32MB	128MB	512K	YⒺ	2MB	–	Y	2Ⓐ	Y	430VX		0 to 55°C	Full PCI	**2632**	$1195	$1395	$1595	–	–
CPLK PMX-xxx	Pent. MMX SCSI	32MB	128MB	512K	–	–	YⓌ	Y	2Ⓐ	Y	430VX		0 to 55°C	Full PCI	**2638**	$1195	$1395	$1595	–	–
CPLF PMX-xxx	Pent. MMX SVGA & SCSI	32MB	128MB	512K	YⒺ	2MB	YⓌ	Y	2Ⓐ	Y	430VX		0 to 55°C	Full PCI	**2633**	$1295	$1495	$1695	–	–
CPLL PMX-xxx	Pent. MMX SVGA	32MB	128MB	512K	YⒻ	2MB	–	–	2Ⓐ	Y	430VX	ⒹⒽ	0 to 50°C	Full PCI	**2639**	$1295	$1495	$1695	–	–
CPLM PMX-xxx	Pent. MMX SVGA & SCSI	32MB	512MB	512K	YⒺ	2MB	YⓋ	Y	2Ⓒ	Y	VIA VP2	ⒹⒿ	0 to 55°C	Full PCI	**2640**	$1895	$2095	$2295	–	–
CPLJ PRO-200	Pent. Pro	32MB	512MB	256K	–	–	–	–	2Ⓐ	Y	440FX		0 to 55°C	Full PCI	**2636**	→	**$1895**	–	–	–
CPLG PRO-200	Pent. Pro SVGA	32MB	512MB	256K	YⒺ	2MB	–	–	2Ⓐ	Y	440FX		0 to 55°C	Full PCI	**2634**		**$2095**	–	–	–
CPLI PRO-200	Pent. Pro SCSI	32MB	512MB	256K	–	–	YⓌ	–	2Ⓐ	Y	440FX		0 to 55°C	Full PCI	**2637**	Intel Pentium PRO	**$2095**	–	–	–
CPLH PRO-200	Pent. Pro SVGA & SCSI	32MB	512MB	256K	YⒺ	2MB	YⓌ	–	2Ⓐ	Y	440FX		0 to 55°C	Full PCI	**2635**		**$2195**	–	–	–
CPRL PR2-200	**Dual** Pentium Pro	32MB	256MB	256K	–	–	–	–	2Ⓑ	Y	440FX	Ⓓ	0 to 55°C	Full PCI	**2641**	→	**$2995**	–	–	–
CPRM PII-xxx	**Pentium II**	32MB	384MB	256K	–	–	–	–	2Ⓑ	Y	440LX	ⒹⓈ	0 to 55°C	Full PCI	**2642**	**Intel Pentium II**	**$1995**	**$2295**	**$2595**	

The **CyberResearch Intel® Pentium All-in-One CPU Cards outlined above** are available with a choice of several different CPU speeds. See pricing above to choose the models with the price/performance specifications best suited to your application. Pentium All-in-One CPU Cards have been designed for use with **ISA or PCI-Bus Passive Backplanes.**

Note: An All-in-One CPU Card is not included in the base price of our Passive Backplane Computer Chassis. **Call for free assistance in selecting the right CPU at the best price point.**

BEST BUYS: Prices are shown in red. All of the above cards feature an on-board **Watchdog Timer** with choice of several time-out intervals, **Dual Enhanced IDE** ports supporting up to 4 IDE hard drives, plus support for 2.88MB floppy drives. All include keyboard connectors (6-pin Mini DIN & 5-pin header). **Keyboard is included** with VRC, VPB, MRV, MPB, RPC, RPB, N1R, & RX (when purchased as complete systems with a CPU). Save $45 when you purchase a rack-mount keyboard at the same time that you purchase a rack-mount PC system. Rack-Mount/Industrial Keyboards are on page 41.

Important: ***Passive Backplane PCs require an All-in-One CPU Card.*** • **Pentium, Pentium MMX, or Pentium Pro-based All-in-One CPU Cards** can be used with **either ISA or PCI Passive Backplane Models** (see pages 35 & 39). • **For an overview of ISA or PCI/ISA Backplanes see page 35.** Call for FREE application assistance.

Pentium Systems: Award BIOS with Plug-&-Play and Green Feature. ***Pentium & Pentium MMX cards include 32MB RAM and a full 512KB Cache! Pentium PRO cards include 32MB RAM and a full 256KB Cache! (Call for pricing to upgrade to Pentium Pro with 512KB or 1MB on-chip Cache).***

NOTES: All Pentium, MMX, & PRO models accept DRAM & EDO DRAM SIMM modules; in addition, the CPLL includes one 168-pin DIMM socket. Our **CPLM** model includes both two DIMM sockets and two SIMM sockets. The **CPRM** Pentium II card has three 168-pin DIMM sockets (no SIMM sockets, as DIMMS are the optimum memory configuration for the Pentium II). Ⓐ: Two RS-232 ports with FIFO *plus* two Universal Serial Bus Ports (USB). Ⓑ: RS-232 ports include FIFO. Ⓒ: One RS-232 serial port with FIFO, one jumper-selectable RS-232/RS-422/RS-485 with FIFO, *plus* two Universal Serial Bus Ports (USB). Ⓓ: Card has socket for optional **Flash Disk** memory DiskOnChip®, 2 to 24MB (larger sizes soon – see page 42). Ⓔ: On-board PCI VGA/Flat-panel (EL/STN/TFT) display controller. Ⓕ: On-board PCI-bus SVGA controller (S3 Trio 64V2/DX). Ⓗ: **CPLL** card features a CPU temperature alarm which beeps when CPU temperature exceeds 60°C. Ⓙ: **CPLM** card includes a Fast Ethernet controller with support for 10Base-T and 100Base-TX. Ⓢ: **CPRM** card has a SoundBlaster 16-compatible built-in audio interface. Ⓥ: These cards incorporate a SCSI Ultra Wide (68-pin high-density "D" connector) interface. Ⓦ: These cards incorporate a combination SCSI interface to SCSI Ultra Wide (68-pin) or Fast SCSI II (50-pin). Adapter cable is included to SCSI Ultra Wide 68-pin "D" (no adapter needed for fast SCSI II).

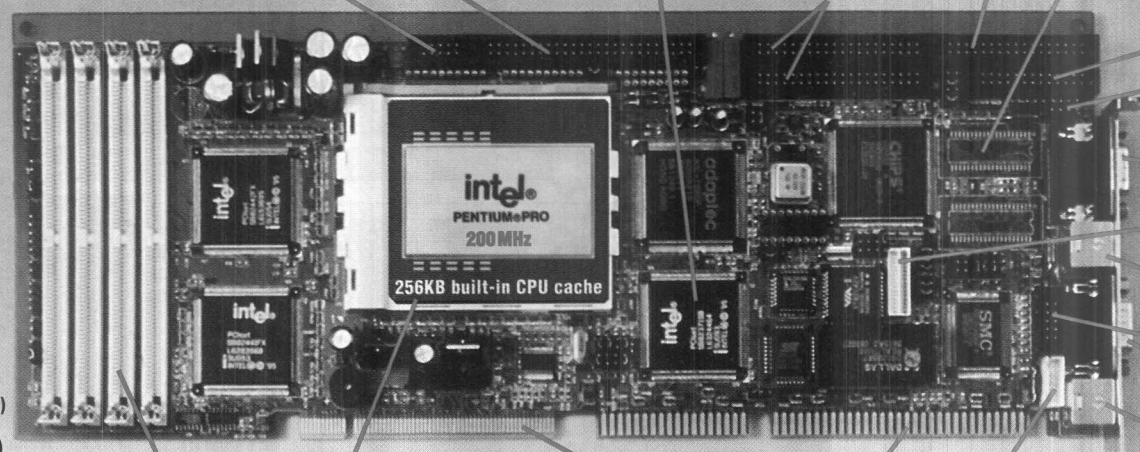
QUANTITY DISCOUNTS: 1-4/LIST 5-9/5% 10-24/10% 25-49/15% **Quantities of a Single Item Per Shipment – Call for Details**

CyberResearch Assistance: Toll-Free 1-800-341-2525 (USA) Tel: 203-483-8815 Fax: 203-483-9024
Applications Engineers: Mon-Fri, 9AM-5PM U.S. Eastern Time • **Internet Website:** http://www.cyberresearch.com • **Fax-on-Demand System:** 203-483-9966 • **BBS:** 203-488-8949

PENTIUM & PENTIUM PRO ALL-IN-ONE PLUG-IN CPU CARDS

#CPLH PRO-200

FOD#2635

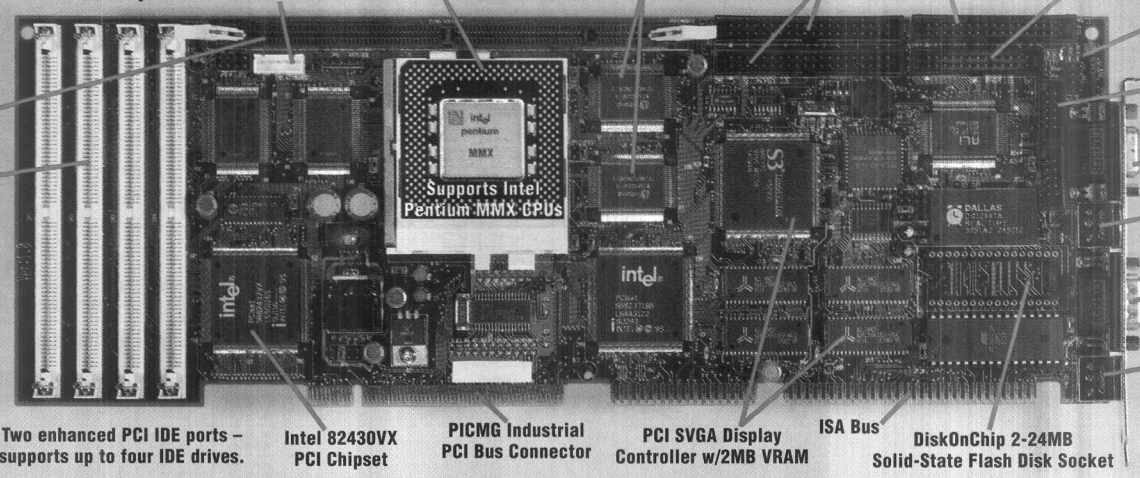


Pentium PRO All-in-One CPU Card with SVGA/Flat-Panel Controller & Ultra-Wide SCSI

NEW!

#CPLL PMX-xxx

FOD#2639

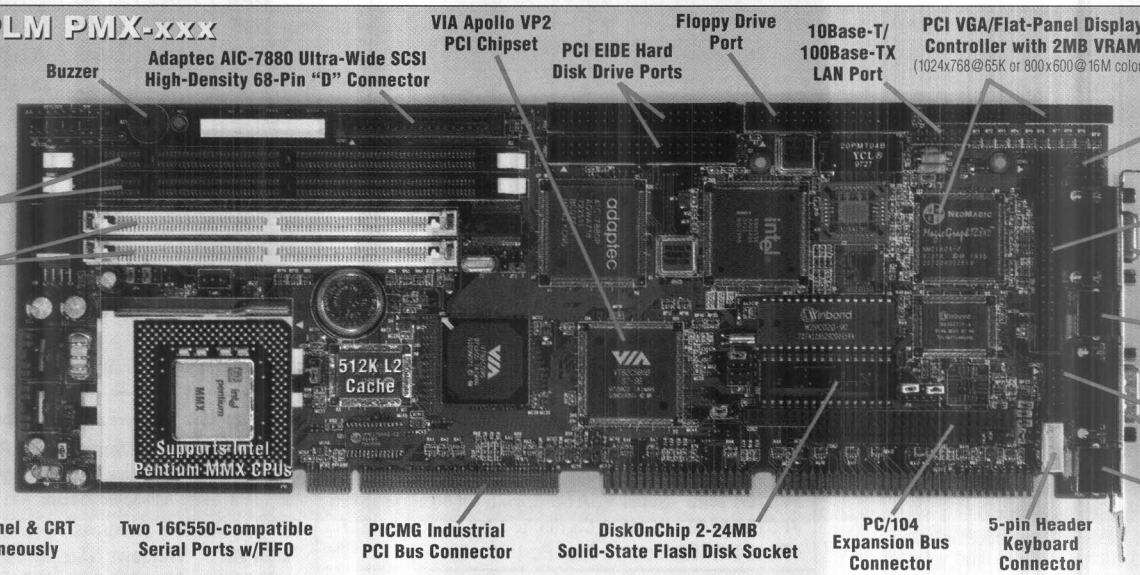


Pentium MMX All-in-One CPU Card w/SVGA, DiskOnChip Flash Disk, & CPU Temperature Alarm

NEW!

#CPLM PMX-xxx

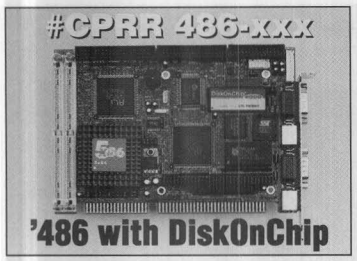
FOD#2640

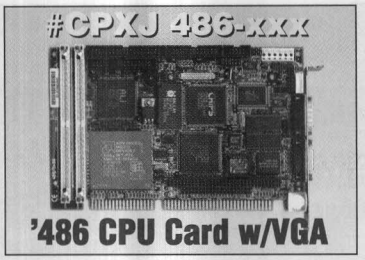


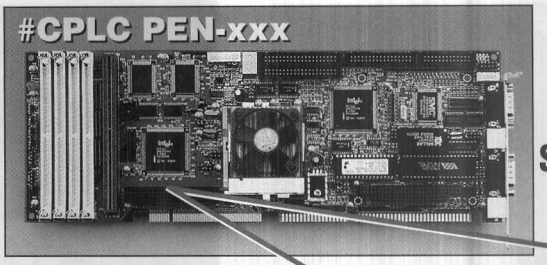
Pentium MMX All-in-One CPU Card with Ultra-Wide SCSI, LCD/CRT VGA, Flash Disk, & 100Base-TX LAN

ALL-IN-ONE CPU CARDS w/INTEL PENTIUM & '486 CPUs

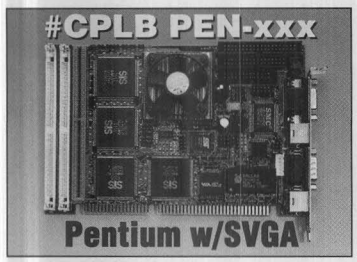
Call for latest CPU & Memory Prices

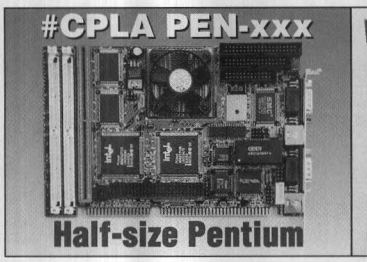


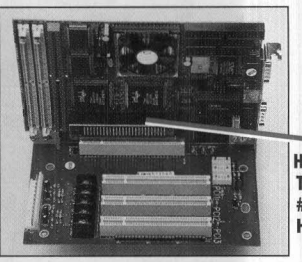




Pentium with optional SVGA or SCSI Module

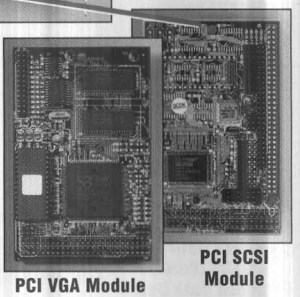






PCI/ISA High-Speed Bus Transfer with a #CPLA PEN-xxx Half-size Card! See page 21.

Optional: either VGA or SCSI Module for use with the #CPLC PEN-xxx.



PCI VGA Module

PCI SCSI Module

CyberResearch All-in-One CPU Cards

Part Number includes RAM & MS-DOS Add the SUFFIX "-C" for CPU Card Only.

CyberResearch Industrial All-in-One CPU Cards — Either with 16/32MB RAM & MS-DOS, or Card only. Call for Qty Discounts!

Microprocessor	Processor Speed (MHz)	System Memory (RAM) (Included in Package Price Only)	Maximum Memory	High-Speed RAM Cache	On-Board SVGA	Video RAM Included	SCSI Controller	Built-in PC/104 Expansion Bus	RS-232 Serial Ports	Parallel Printer Port (SPP)	Enhanced Parallel Port (EPP) (ECP)	IDE Hard Drive & Floppy Interface	2.88 MB Floppy Support	On-Board RAM/ROM	Enhanced IDE BIOS	Card Length	Power Consumption (Max)	Operating Temperature	Backplane Type (Bus)	Fax-On-Demand Document #	Package Price with MS-DOS and 16 MB Memory (RAM)	Price CPU Card only
#CPRR 486-100	80486DX/4	100 MHz	16 MB	64 MB	–	–	–	–	Y	2	Y	Y	Y	Y	Ⓓ	Y	Short	+5V@2A	0 to 55°C	ISA	**2618**	**$495**	**$395**
#CPRN 486-100	80486DX/4	100 MHz	16 MB	64 MB	256K	–	–	–	Y	2	Y	Y	Y	Y	–	Y	Short	+5V @ 2.1A ±12V @ 20mA	0 to 55°C	ISA	**2608**	**$545**	**$445**
#CPXG 486-100	80486DX/4	100 MHz	16 MB	64 MB	256K	–	–	–	Y	2Ⓚ	Y	Y	Y	Y	–	Y	Short	+5V@3A	0 to 55°C	ISA	**2609**	**$595**	**$495**
#CPXG 486-133	486DX/5	133 MHz	16 MB	64 MB	256K	–	–	–	Y	2Ⓚ	Y	Y	Y	Y	–	Y	Short	+5V@3A	0 to 55°C	ISA	**2609**	**$645**	**$545**
#CPRP 486-100	80486DX/4	100 MHz	16 MB	64 MB	128K	Y	1MB	–	–	2	Y	Y	Y	Y	Ⓓ	Y	Short	+5V@2A	0 to 55°C	ISA	**2619**	**$645**	**$545**
#CPRP 486-133	486DX/5	133 MHz	16 MB	64 MB	128K	Y	1MB	–	–	2	Y	Y	Y	Y	Ⓓ	Y	Short	+5V@2A	0 to 55°C	ISA	**2619**	**$695**	**$595**
#CPXJ 486-100	80486DX/4	100 MHz	16 MB	64 MB	128K	YⒺ	1MB	–	Y	2Ⓚ	Y	Y	Y	Y	–	Y	Short	+5V@1.8A	0 to 60°C	ISA	**2612**	**$795**	**$695**
#CPXJ 486-133	486DX/5	133 MHz	16 MB	64 MB	128K	YⒺ	1MB	–	Y	2Ⓚ	Y	Y	Y	Y	–	Y	Short	+5V@1.8A	0 to 60°C	ISA	**2612**	**$845**	**$745**

The **CyberResearch Intel® Pentium All-in-One CPU Cards Outlined Below** are available with a choice of **Intel® Pentium CPUs** including: **100MHz, 133MHz, 166MHz, or 200MHz**. Our Pentium All-in-One CPU Cards have been designed for use with **ISA** or **PCI-Bus Passive Backplanes.** ***Note: An All-in-One CPU Card is not included in the Base Price of Passive Backplane Chassis.***

For details call Fax-on-Demand. Pricing & Performance Specifications subject to change at any time.

			Pentium CPU Card Specs			Fax-on-Demand FOD#	Package w/32MB & DOS (CPU only: Deduct $150)				
			Operating Temp	Chip Set	Card Length/Bus		100 MHz	133 MHz	166 MHz	200 MHz	
#CPLA PEN-xxx	Pentium	32MB 64MB 512K – – – – 2Ⓐ Y	0 to 55°C	430VX	Short ISA	**2621**	**$845**	**$945**	**$995**	**$1095**	**For Faster CPU Cards: (MMX, PRO, P-II, etc.) see page 36**
#CPLB PEN-xxx	Pentium SVGA	32MB 64MB 512K YⒺ Ⓜ – – 2Ⓐ Y	0 to 55°C	SiS 551X	Short ISA	**2622**	$945	$1045	$1095	$1195	
#CPXK PEN-xxx	Pentium VGA CRT/FLAT-PNL	32MB 128MB 512K YⒺ 1MB – Y 2Ⓚ Y	0 to 60°C	ALI M152X	Short ISA	**2623**	$1245	$1345	$1395	$1495	
#CPLC PEN-xxx	Pentium	32MB 128MB 512K – – – Y 2 Y	0 to 55°C	430FX	Full PCI	**2625**	**$895**	**$995**	**$1045**	**$1145**	
#CPLC PEN-xxxS	Pentium W/SCSI MODULE	32MB 128MB 512K – – Y Y 2 Y	0 to 55°C	430FX	Full PCI	**2625**	$1045	$1145	$1195	$1295	
#CPLC PEN-xxxV	Pentium W/SVGA MODULE	32MB 128MB 512K YⒻ 1MB – Y 2 Y	0 to 55°C	430FX	Full PCI	**2625**	$1095	$1195	$1245	$1345	
#CPPD PEN-xxx	Pentium SVGAⒼ	32MB 384MB 512K YⒻ 2MB – – 2Ⓐ Y	0 to 60°C	430HX	Full PCI	**2627**	$1245	$1345	$1395	$1495	
#CPPC PEN-xxx	Pentium SVGAⒼ & SCSI	32MB 256MB 512K YⒻ 2MB YⓍ – 2Ⓑ Y	0 to 60°C	430HX	Full PCI	**2624**	$1345	$1445	$1495	$1595	

BEST BUYS in red. All of the above CPU cards include keyboard connectors (6-pin Mini-DIN & 5-pin header). **A keyboard is included** with many of our systems when purchased as complete systems with a CPU (see page 40). Save $45 when you purchase an industrial keyboard (page 41) at the same time that you purchase a PC system. **Pentium Systems:** Award or AMI BIOS with Plug & Play and Green Feature. ***No extra charge: '486s include 16MB RAM. Pentium cards include 32MB RAM & full 512KB Cache!***

Important: ***Passive Backplane PCs require an All-in-One CPU Card.*** • **'486, Pentium, Pentium MMX, or Pentium Pro-based All-in-One CPU Cards** can be used with **either ISA or PCI Passive Backplane models** (see pages 35 & 39). • **For an overview of ISA or PCI/ISA Backplanes see page 35.** Call for FREE application assistance.

NOTES: All Pentium models accept DRAM & EDO DRAM SIMM modules. Ⓐ: Two RS-232 ports with FIFO + two Universal Serial Bus Ports (USB). Ⓑ: RS-232 ports include FIFO. Ⓓ: Card has socket for optional **Flash Disk** memory DiskOnChip, 2 to 24MB (larger sizes soon – see page 42). Ⓔ: On-board PCI VGA & Flat panel (EL/STN/TFT) controller. Ⓕ: On-board PCI-bus SVGA controller. Ⓖ: **CPPC/CPPD** cards feature ATI MACH 64 Chipset: 64-bit PCI Graphics Accelerator with 2MB VRAM – up to 1280x1024x65K Colors @ 60Hz or 1024x768x16.7M Colors @ 80Hz. Ⓚ: One RS-232 serial port, one serial port jumper-selectable RS-232/RS-422/RS-485. Ⓜ: **CPLB** card uses VGA PCI set shared memory architecture (no VRAM required). Ⓧ: This card incorporates a SCSI Ultra-Wide (68-pin high-density "D" connector) interface and a Fast SCSI II (50-pin) connector.

Each CyberResearch **All-In-One CPU Card** includes:
- An Intel® Pentium or a '486 microprocessor
- **32MB RAM* (16MB* on '486 CPU Cards)**
- **MS-DOS*** (* **items** included in Package Price only)
- Disk controller for 2 IDE hard drives & 2 floppy drives
- Mini-DIN keyboard connector + std. kbd. adapter cable
- Two serial ports & one parallel (printer) port
- A Watchdog Timer & a Battery-Backed Clock/Calendar

Expand your CPU's capabilities with PC/104 modules Save a slot! PC/104 modules will plug directly on to many of the CyberResearch All-in-One CPU boards.

#PC104 1430 Super VGA Card, 1MB Video RAM...**$195**
#PC104 1440 PCMCIA Carrier for 2 PCMCIA Cards ..**$275**
#PC104 1545A Isolated Dual-Port RS-422/485.....**$175**

See page 42 for solid-state DiskOnChip Modules.
Please note that ***PC Keyboards are sold separately.***

Accessories: ***Memory Prices Change – Call for the latest!***

#SIMM xMB RAM (Memory) for CPU Cards.....**$Call**
Add up to 256MB of Memory to your Package Price: Add 8 MB: **$40;** Add 16MB: **$60;** Add 32MB: **$100;** Add 64MB: **$300.**

#MSD W95R MS Windows 95 (Save $50 with CPU).....**$199**
#MSD WNT Windows NT (available on CD-ROM only).....**$395**
#MSI CDI CD-ROM Drive, IDE (24x speed).....**$100**

For more info call our Fax-on-Demand system: 203-483-9966.

CyberResearch Assistance: Toll-Free 1-800-341-2525 (USA) ☎ Tel: 203-483-8815 Fax: 203-483-9024
Applications Engineers: Mon-Fri, 9AM-5PM U.S. Eastern Time • **Internet Website:** http://www.cyberresearch.com • **Fax-on-Demand System:** 203-483-9966 • **BBS:** 203-488-8949

PC Chassis & Systems Comparison Chart

CyberResearch Rack-Mount & Panel-Mount PCs

Compare Our Prices!

CyberResearch Rack/Panel-Mount Industrial PCs — **Quantity Discounts Available** — **Call for Current Pricing**

Several of our CyberResearch Rack-Mount PCs include telescopic rack slide rails (an $85 value). Others offer slide rails as an option. See below for details ☞

Part Number	Page Number	Display Size & Type	Use a Rack-Mount Monitor on units w/o monitors: pp. 12-15	Display Adapter	Touch Screen Option	Power Supply Watts	Drive Bays: External Access QTY 5¼"	Drive Bays: External Access QTY 3½"	Drive Bays: Internal Access QTY 3½"	Slots: 16-Bit ISA	Slots: CPU Slots (*Holds one ISA Card or a CPU Card)	Slots: PCI Slots	NEMA 4/12 or 1 Rated	Dimensions WxHxD	Slides for Rack Mounting	Integral Keyboard (# keys)	Approximate Weight of Empty Chassis w/o Cards, Drives, etc.	Pricing: Each System Requires an All-in-One CPU Card or Motherboard — Pages 34-38: Motherboard Ready (see pg. 34)	Model 800 8 ISA Backplane	Model 530P 3-2-3 ISA/PCI	Model 1400P 8-2-4 ISA/PCI	Model 1400 14 ISA
For additional Product Information and Data Sheets call Fax-on-Demand 203-483-9966; Request FOD# 2000.																		★★★ Qty of Slots in each model shown above.				
#VRK xxx MR	16	10" Color CRT	SVGA/PCI	–	250	3 or 3	2 or 2	# of slots varies with choice of motherboard			1	19x10.5x25.0" 483x266x635mm	Y	Y	70 lbs	$3300	–	–	–	–	–
#VRKP xxx I/P	16	10" Color CRT	SVGA	–	250	3 or 3	2 or 2	★	★	★	1	19x10.5x25.0" 483x266x635mm	Y	Y	70 lbs	–	$3395	$3495	–	–
#VTK xxx MR	16	10" Color CRT	SVGA/PCI	–	250	3 or 3	2 or 2	# of slots varies with choice of motherboard			1	19x10.5x25.0" 483x266x635mm	Y	Y	70 lbs	$3450	–	–	–	–	–
#VTKP xxx I/P	16	10" Color CRT	SVGA	–	250	3 or 3	2 or 2	★	★	★	1	19x10.5x25.0" 483x266x635mm	Y	Y	70 lbs	–	$3545	$3645	–	–
#VRC xxx MR	17	10" Color CRT	SVGA/PCI	–	250	3 or 3	2 or 2	# of slots varies with choice of motherboard			1	19x8.75x23.7" 483x222x602mm	Y	101K	65 lbs	$1700	–	–	–	–	–
#VPB xxx I/P	17	10" Color CRT	SVGA	–	250	3 or 3	2 or 2	★	★	★	1	19x8.75x23.7" 483x222x602mm	Y	Ⓚ	65 lbs	–	$1795	$1895	$2095	$1895
#MRV xxx MR	17	9" Mono CRT	SVGA/PCI	–	250	3 or 3	2 or 2	# of slots varies with choice of motherboard			1	19x8.75x23.7" 483x222x602mm	Y	101K	65 lbs	$1200	–	–	–	–	–
#MPB xxx I/P	17	9" Mono CRT	SVGA	–	250	3 or 3	2 or 2	★	★	★	1	19x8.75x23.7" 483x222x602mm	Y	Ⓚ	65 lbs	–	$1295	$1395	$1595	$1395
#RPC xxx MR	17	Use w/optional External Monitor		Ⓣ	250	6 or 6	2 or 2	# of slots varies with choice of motherboard			1	19x8.75x23.7" 483x222x602mm	Y	Ⓚ	35 lbs	$600	–	–	–	–	–
#RPB xxx I/P	17	Use w/optional External Monitor		Ⓣ	250	6 or 6	2 or 2	★	★	★	1	19x8.75x23.7" 483x222x602mm	Y	Ⓚ	35 lbs	–	$695	$795	$995	$795

The PC Systems Outlined Below include: a selection of **Passive Backplane (ISA or PCI)** and **Motherboard-Ready (MR) Units** ***(CPU Card or Motherboard is not included in the Base Price – pages 34-38),*** with a choice of **Integral Flat-Panel LCD & CRT Displays** or basic units for use with remote monitors.

CyberResearch SVGA Display Adapter Resolution/Colors:

SVGA Res. w/1 MB VRAM	Pixels:	640x480	800x600	1024x768
	Colors:	16.8 Million	65,536	256

Part Number	Page Number	Display Size & Type		Display Adapter	Touch Screen Option	Power Supply Watts	Drive Bays: External Access QTY 5¼"	Drive Bays: External Access QTY 3½"	Drive Bays: Internal Access QTY 3½"	Slots: 16-Bit ISA	Slots: CPU Slots (*Holds one ISA Card or a CPU Card)	Slots: PCI Slots	NEMA 4/12 or 1 Rated	Dimensions WxHxD	Slides for Rack Mounting	Integral Keyboard (# keys)	Approximate Weight of Empty Chassis w/o Cards, Drives, etc.	Base Price (no CPU)
#NWC 9C I/P	20	10" Color CRT	1024x768	–	200	–/1	–/1	9C: 10 9CP: 5	– 1	– 3	4	19x10.5x16.1" 483x266x410mm	–	Ⓐ	53 lbs	ISA: $2895 PCI: $2995
#N4W 15C I/P	19	15" Color CRT	1024x768	Y	250	–/1	–/2	ISA: 8 PCI: 3	– 1	– 3	4	19x14.0x20.0" 483x354x510mm	–	Ⓑ	82 lbs	ISA: $3395 PCI: $3595
#NWD 715 I/P	18	15" Color CRT	1024x768	Y	250	–/1	–/1	ISA: 7 PCI: 4	– 1	– 2	4	19x14.0x17.7" 483x356x450mm	–	Ⓒ	64 lbs	ISA: $2695 PCI: $2795
#GRMB 4017 I/P	15	17" Color CRT	1280x1024	Y	200	–/–	–/3	ISA: 7 PCI: 3	– 1	– 3	4	19x14.0x19.7" 483x356x500mm	–	Ⓚ	55 lbs	ISA: $2795 PCI: $2995
#N4W AX6260 ISA	20	9" Flat-Panel EL	640x480	Y	150	–/1	–/1	8	–	–	4	19x10.5x8.8" 483x266x224mm	–	Ⓔ	29 lbs	$4495
#N4W 14T I/P/MR	18	9.4" Flat-Panel TFT	640x480	Y	250	–/1	–/3	ISA and PCI versions are also available			4	19x10.5x18.9" 483x266x480mm	$95	Ⓔ	36 lbs	$3200
#N1R 14T I/P	21	9.4" Flat-Panel TFT	640x480	Y	250	3/1	–/1	ISA: 14 PCI: 8	– 2	– 4	1	19x8.75x18.6" 483x222x473mm	$95	Ⓚ	36 lbs	ISA: $2995 PCI: $3195
#N1R 14TMB MR	21	9.4" Flat-Panel TFT	640x480	Y	250	3/1	–/1	3	1	3	1	19x8.75x18.6" 483x222x473mm	$95	Ⓚ	36 lbs	$2900
#NWC 8TMR MR	20	10.4" Flat-Panel TFT	640x480	Y	250	–/1	–/1	ISA and PCI versions are also available			4	19x10.5x8.6" 483x266x220mm	–	Ⓐ	33 lbs	$2900
#N4W 8T1 I/P	20	10.4" Flat-Panel TFT	640x480	Y	200	–/1	–/1	8T1: 8 8T1P: 3	– 2	– 3	4	19x10.5x9.8" 483x266x248mm	–	Ⓔ	30 lbs	ISA: $3195 PCI: $3295
#PKR 10 –	20	10.4" Flat-Panel TFT	640x480	Y	250	–/–	–/1	–	–	–	4	12.6x13.5x3.7" 320x342x94mm	–	56K	15 lbs	486: $3995 Pent.: $4395
#RWL 14 I/P	21	10.4" Flat-Panel TFT	640x480	Y	250	1/3	–/–	ISA: 14 PCI: 8	– 2	– 4	1	19x8.75x17.5" 483x222x444mm	$85	Ⓚ	36 lbs	ISA: $3295 PCI: $3495
#RWL MR MR	21	10.4" Flat-Panel TFT	640x480	Y	250	1/3	–/–	# of slots varies with choice of motherboard			1	19x8.75x17.5" 483x222x444mm	$85	Ⓚ	36 lbs	$3200
#PMR 10T ISA	4A	10.4" Flat-Panel TFT	640x480	Y	65	–/1	–/1	7	–	–	1	12.6x10.8x7.5" 320x275x191mm	–	Ⓚ	29 lbs	$2995
#NXT 12T I/P	13	12.1" Flat-Panel TFT	800x600	Incl.	65	–/–	–/2.5	1 half-length slot for an ISA or a PCI card			4	14.2x10.9x3.3" 360x277x82mm	–	Ⓚ	32 lbs	$2695
#N4W 8DSP PCI	19	13.8" Dual Scan LCD	1024x768	Y	250	1/1	–/1	5	1	4	4	19x14.0x10.0" 483x354x256mm	–	Ⓕ	35 lbs	$3795
#N4W 8TFP PCI	19	13.8" Flat-Panel TFT	1024x768	Y	250	1/1	–/1	5	1	4	4	19x14.0x10.0" 483x354x256mm	–	Ⓕ	35 lbs	$5795
#NRB 5 PCI	20	13.8" Flat-Panel TFT	1024x768	Y	250	1/1	–/1	2	1	2	4	16.6x11.8x8.4" 420x300x213mm	–	Ⓚ	27 lbs	DSTN: $3595 TFT: $5595
#N1L 5P PCI	4B	Use w/optional External Monitor		Ⓣ	200	–/2	–/–	2	1	2	1	19x3.5x17.0" 483x89x430mm	–	Ⓚ	22 lbs	$565
#N1L 5CP PCI	4B	Use w/optional External Monitor		Ⓣ	200	1/1	2/–	2	1	2	1	19x3.5x18.0" 483x89x456mm	–	Ⓚ	22 lbs	$595
#RPA MB MR	26	Use w/optional External Monitor		Ⓣ	250	3/2	–/–	ISA and PCI versions are also available			1	19x7.0x20.0" 483x178x508mm	$85	Ⓚ	27 lbs	$500
#N1C 14 I/P/MR	26	Use w/optional External Monitor		Ⓣ	250	2/1	–/1	ISA: 14 PCI: 8	– 2	– 4	1	19x7.0x18.5" 483x178x470mm	$85	Ⓚ	44 lbs	ISA: $595 PCI: $695
#N1D 14 I/P/MR	26	Use w/optional External Monitor		Ⓣ	300	6/–	2/–	ISA: 14 PCI: 8	– 2	– 4	1	19x8.75x25.0" 483x222x635mm	$85	Ⓚ	53 lbs	ISA: $795 PCI: $895
#RXS 1225 ISA	26	Use w/optional External Monitor		Ⓣ	250	–/3	–/–	12	–	–	1	19x7.0x17.7" 483x178x450mm	Ⓖ	Ⓚ	30 lbs	$895
#N1A 14 I/P	27	Use w/optional External Monitor		Ⓣ	250	2/2	–/–	ISA: 14 PCI: 8	– 2	– 4	1	19x7.0x17.0" 483x178x430mm	$95	Ⓚ	33 lbs	ISA: $695 PCI: $795
#N1A 14MR MR	27	Use w/optional External Monitor		Ⓣ	250	2/2	–/–	# of slots varies with choice of motherboard			1	19x7.0x17.0" 483x178x430mm	$95	Ⓚ	33 lbs	$600
#RRB 15 I/P/MR	27	Use w/optional External Monitor		Ⓣ	250	3/1	–/1	ISA: 15 PCI: 8	– 2	– 4	1	19x7.0x17.0" 483x178x430mm	$95	Ⓚ	33 lbs	ISA: $745 PCI: $795
#RNA 14 I/P	28	Use w/optional External Monitor		Ⓣ	250	2/1	–/2	ISA: 14 PCI: 8	– 2	– 4	1	19x7.0x17.6" 483x178x448mm	$85	Ⓚ	33 lbs	ISA: $495 PCI: $595
#RNA 14MR MR	28	Use w/optional External Monitor		Ⓣ	250	2/1	–/2	# of slots varies with choice of motherboard			1	19x7.0x17.6" 483x178x448mm	$85	Ⓚ	33 lbs	$400
#RNB 14 I/P/MR	28	Use w/optional External Monitor		Ⓣ	250	–/–	2/–	ISA: 14 PCI: 8	– 2	– 4	1	19x7.0x17.6" 483x178x448mm	$85	Ⓚ	33 lbs	ISA: $595 PCI: $695
#RNC 20/19P I/P	29	Use w/optional External Monitor		Ⓣ	350	2/1	–/2	ISA: 20 PCI: 13	– 2	– 4	1	19x8.75x25" 483x222x635mm	$85	Ⓚ	53 lbs	ISA: $895 PCI: $995
#RRA 2044S20 ISA	29	Use w/optional External Monitor		Ⓣ	300	4/4	–/–	20Ⓢ	–	–	1	19x8.75x25.7" 483x222x653mm	$95	Ⓚ	49 lbs	$1295
#RRA 2044DP16 PCI	29	Use w/optional External Monitor		Ⓣ	300	4/4	–/–	Ⓓ	8Ⓓ	12	1	19x8.75x25.7" 483x222x653mm	$95	Ⓚ	49 lbs	$1295
#RNT 2060S I/P	30	Use w/optional External Monitor		Ⓣ	600	2/6	–/–	ISA: 20Ⓢ PCI: 13Ⓢ	– 2	– 4	1	19x10.5x18" 483x266x456mm	$85	Ⓚ	36 lbs	ISA: $1395 PCI: $1495
#RPT 860 I/P/MR	32	Use w/optional External Monitor		Ⓣ	600	6/–	–/2	ISA: 8 PCI: 3	– 2	– 3	1	19x8.75x25" 483x222x635mm	$85	Ⓚ	50 lbs	ISA: $1195 PCI: $1295
#RPT 2060 I/P	32	Use w/optional External Monitor		Ⓣ	600	3/–	1/–	ISA: 20 PCI: 13	– 2	– 4	1	19x8.75x25" 483x222x635mm	$85	Ⓚ	50 lbs	ISA: $1295 PCI: $1495
#RST 862 I/P/MR	33	Use w/optional External Monitor		Ⓣ	600	5/–	–/–	ISA: 8 PCI: 3	– 2	– 3	1	19x7x19.25" 483x222x489mm	$85	Ⓚ	33 lbs	ISA: $1295 PCI: $1395
#RST 2060 I/P	33	Use w/optional External Monitor		Ⓣ	600	3/–	–/–	ISA: 20 PCI: 13	– 2	– 4	1	19x7x26.0" 483x222x660mm	$85	Ⓚ	33 lbs	ISA: $1395 PCI: $1595
#RRT 2060H I/P	33	Use w/optional External Monitor		Ⓣ	600	8/–	–/–	ISA: 20 PCI: 13	– 2	– 4	1	19x10.5x23.3" 483x266x590mm	$95	Ⓚ	50 lbs	ISA: $1495 PCI: $1695

- **VRK, VRKP, VTK, & VTKP models** include an integral **Pull-out Industrial Keyboard** (VTK & VTKP models have a built-in trackball). See pages 16 & 41.

Important: Motherboard-Ready & Passive Backplane PCs require a Motherboard or All-in-One CPU Card.

Selecting a CPU is simple when you have the information you need: see pages 34 to 38 for motherboards and CPU cards to complete your system.

Dual Hot-Swappable Redundant Power Supplies: see pages 30-33.

I/P = ISA and PCI versions available.
MR = Motherboard version available.

Ⓐ Membrane Keypad – 60 Keys for Data Entry, 10 Function Keys, and 10 Programmable Macro Keys.

Ⓑ Membrane Keypad – 51 Keys for Data Entry, and 24 user Function Keys.

Ⓒ Membrane Keypad – 39 Keys for Data Entry, 10 Function Keys, and 10 Programmable Macro Keys.

Ⓓ Segmented Backplane – see page 35 for a detailed chart of our backplanes, with explanatory notes. **#RRA 2044DP16** uses **#PBPN 16D**.

Ⓔ Membrane Keypad – 59 Keys for Data Entry and 20 user Function Keys.

Ⓕ Membrane Keypad – 59 Keys for Data Entry and 24 user Function Keys.

Ⓖ Integral rack slides are included in base price of #RXS 1225 unit.

Ⓚ Remote Keyboards are optional. **#OIX 2107R** Desktop Keyboard (with purchase of chassis & CPU).....**$40**

Ⓢ The Segmentable passive backplane in these models can be used for multiple independent systems in one chassis – see page 35 for backplane information, or call our applications engineers for more info.

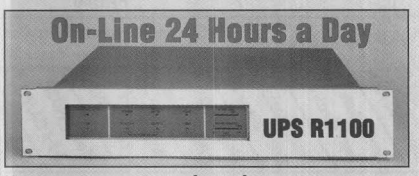
Ⓣ Remote Touch Screen on external monitor – see page 15.

With our CRT & Flat-Panel systems, the correct **CRT/Flat-Panel Display Controller is INCLUDED FREE.**

See pages 40-43 for Hard Drives and other Optional Accessories.

Package PC Systems with Motherboard or All-In-One CPU Order the PC System and CPU together and get a completely loaded & tested system *at no additional charge.* ***A FREE Service – Call for Info!***

Rack-Mounting Uninterruptible Power Supply



Protect your data and equipment from sudden disaster. A UPS will allow you to continue operating your PC during a power failure for a short period of time, so you can shut down in an organized way. Features: **true on-line design**, continuous isolation, power conditioning and **zero time gap switchover** upon power failure. Includes one surge-protected outlet *and* 4 UPS outlets. Mounts in any standard 19" rack, 2 rack spaces (2 RU/3.5"/88.9mm). **FOD#2890**

#UPS R650	Rack-Mount 650VA Continuous Online UPS.....**$999**
#UPS R800	Rack-Mount 800VA Continuous Online UPS....**$1249**
#UPS R1100	Rack-Mount 1100VA Continuous Online UPS..**$1449**
#UPS R1500H	Heavy-Duty Rack-Mt.1500VA UPS (5.25" High)...**$2049**
#UPS PWWS	UPS & Power Monitoring Softw. for Windows..**$129**

Rack-Mounting Isobar Surge Protector

The **Rack-Mount Isobar Surge Protector** uses Toroidal Chokes, High-Frequency Capacitors, Metal Oxide Varistors, & VHF Capacitors to provide the widest possible range of protection for your equipment. The **IBR12** offers transient suppression of up to 13,000-Amp spikes, with instantaneous response time. Just a single rack space high (1.75"), the **IBR12** has 12 AC outlets (2 in front, 10 in back), is rated for a total load of 15 Amps, has a built-in circuit breaker, and an illuminated power switch. Eight of the outlets offer 40 dB noise suppression, while four enhanced outlets provide 75 dB noise suppression for more sensitive equipment. The **SRP IBR12** comes with **$10,000** of **Isobar Lifetime Insurance.** Call Fax-on-Demand for info.

#SRP IBR12 Isobar Rack-Mount 12-Outlet Surge Suppressor.....**$149**

Industrial Power Supplies: AC-to-DC or DC-to-DC

Ordering Information: *Suitable for use with most CyberResearch Rack-Mount PCs*

Industrial AC Input Power Supplies (Call for ATX models)

#PWR 250A	250W Universal Power Supply, 90-135 or 180-270 VAC; 47-63Hz...**$145**
#PWR 300A	300W Universal Power Supply, 90-135 or 180-270 VAC; 47-63Hz...**$195**
#PWR 935A	350W Universal Power Supply, 80-140/170-270 VAC; 47-63, 400Hz..**$245**
#PWR 400A	400W Universal Power Supply, 90-135 or 180-270 VAC; 47-63Hz...**$345**

Industrial DC Input DC-DC Converter (Call for ATX models)

#PWR 348A −48VDC Input 300W Power Supply / DC-DC Converter.....**$450**
Input: −40 to −57VDC, max. 10A @ −48V; Operating Temp: −4°F to 158°F (−20 to +70°C)

#PWR 925T −48VDC Input 250W Power Supply / DC-DC Converter.....**$360**
Input Voltage: −40 to −57VDC; max. Input Current: 8A at −48VDC

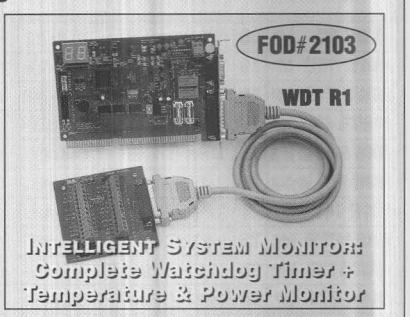
#PWR 925C +24VDC Input 250W Power Supply / DC-DC Converter.....**$400**
Input Voltage: +19 to +30VDC; max. Input Current: 16A at +24VDC

#PWR 916V +12VDC Input 160W Power Supply / DC-DC Converter.....**$400**
Input Voltage: +8.5 to +16VDC; max. Input Current: 25A at +12VDC

Power Supply Upgrades:

#PSA 20250	200W to 250W.....$50	**#PSA 25548**	250W to −48VDC/250W....$250
#PSA 20300	200W to 300W.....$100	**#PSA 25348**	250W to −48VDC/300W....$300
#PSA 20350	200W to 350W.....$150	**#PSA 30350**	300W to 350W.....$50
#PSA 20400	200W to 400W.....$250	**#PSA 30400**	300W to 400W.....$150
#PSA 20112	200W to +12VDC/160W....$300	**#PSA 30112**	300W to +12VDC/160W....$200
#PSA 20524	200W to +24VDC/250W....$300	**#PSA 30524**	300W to +24VDC/250W....$200
#PSA 20548	200W to −48VDC/250W....$300	**#PSA 30548**	300W to −48VDC/250W....$200
#PSA 20348	200W to −48VDC/300W....$350	**#PSA 30348**	300W to −48VDC/300W....$250
#PSA 25300	250W to 300W.....$50	**#PSA 35400**	350W to 400W.....$100
#PSA 25350	250W to 350W.....$100	**#PSA 35112**	350W to +12VDC/160W....$150
#PSA 25400	250W to 400W.....$200	**#PSA 35524**	350W to +24VDC/250W....$150
#PSA 25112	250W to +12VDC/160W....$250	**#PSA 35548**	350W to −48VDC/250W....$150
#PSA 25524	250W to +24VDC/250W....$250	**#PSA 35348**	350W to −48VDC/300W....$200

Watchdog Timer Boards



A Watchdog Timer provides stand-alone or unmanned applications with additional protection against system "crashing" or "hang-up" caused by software bugs, power problems, or system errors. If your PC controls or monitors a process, our Watchdog Timer cards can re-start your computer *automatically* after an unexpected crash. Your system can be back on-line in moments, instead of the next day. Both models operate independently, requiring no system resources. Note that our All-in-One CPU cards (pages 36 to 38) have built-in watchdog timer circuits.

WDT R1 Intelligent Model Monitors your System for Failures

Features include: software programmable **Watchdog Timer; Temperature Monitor** (±1°C) with *on-board 2-digit LED display* (helps warn of overheating – alarm can be set to 50°, 60°, or 70°C); and a **Computer Power Failure Monitor**. **WDT R1** board has 2 connectors: a 1-meter 25-pin cable and screw terminal panel makes external connections easy, and a DB-9 serial interface (RS-232) which allows it to communicate system status.

- Time-out settable from 10ms to 167772.15 sec. (>46 hours).
- Terminal Panel tied to relays and signals on board **WDT R1** alerts external devices of re-start, alarm conditions, etc.
- Easily programmed via printer-like interface – write to LPT.

Base Model Provides Popular Watchdog Timer Features

User-selectable delay before reset provides full control. A male DB-15 connector can be used to control or reset other system functions while PC is off-line. Features include:

- 3 on-board 16-bit timers, time-out settable 10ms to 10 min.
- Connector tied to relay alerts external devices of re-start.
- Source code & examples TurboC, Turbo Pascal, QuickBASIC.

Ordering Information: Call Fax-on-Demand for info: **FOD#2103, 2104**

#WDT R1	Intelligent Watchdog Bd. w/1m Cable, Terminal Panel, Manual..**$299**
#WDT B3	Watchdog Timer Bd. w/PC Reset Cable, Software, & Manual **$109**

Cooling Protection!

24 CFM Keeps your PC & Pentium CPU Cool.

Ordering Information:

#FAN 01 Dual Fan Card...**$39**

CyberResearch Assistance: Toll-Free 1-800-341-2525 (USA) Tel: 203-483-8815 Fax: 203-483-9024
Applications Engineers: Mon-Fri, 9AM-5PM U.S. Eastern Time • **Internet Website:** http://www.cyberresearch.com • **Fax-on-Demand System:** 203-483-9966 • **BBS:** 203-488-8949

CyberResearch is now able to offer you a variety of different keyboard options designed to fit inside a standard 19" rack. Most provide an excellent tactile feel which is **eminently suitable for touch-typing**. All but one of our keyboards require just a single rack space of height (1 RU / 1.75" high).

Using a mouse with your rack-mount PC can be awkward. We have a better solution: a rugged rack-mount keyboard with your choice of an integrated **trackball** or the newest rugged pointing device, the high-performance **Micro-Hulapoint™**.

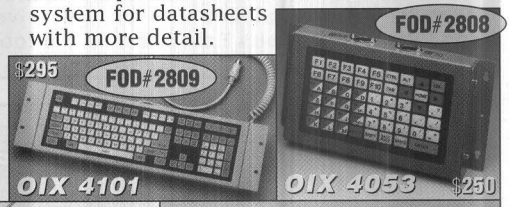
Model **#OIX 1410** is based on our popular **#OIX 6010** keyboard. The **1410**'s trackball is Microsoft mouse compatible with 2 buttons. It is centered under the space bar for added convenience.

The new **#OIX 7114** is our most advanced keyboard. It features it is the most reasonably-priced rack-mount keyboard we've found. It uses 13" of rack depth, with a handle that protrudes 1.75".

The heavy-duty **#OIX 6010** is mounted in a rugged aluminum case which slides in and out of the rack housing. It's securely supported in both the front and back. The keyboard slides out with ease and firmly locks into position, yet it can be unlocked and put away with a single finger. A locking door protects the keyboard when not in use, and is spring-loaded for easy opening and closing. This industrial design provides a full 101-key layout, an excellent tactile feel, & a comfortable, rounded wrist-rest to make typing a pleasure. Operating temp: 0 to 60°C.

sacrificing tactile feel. The built-in **Micro-Hulapoint™** pointing device provides an optimum Windows™ user interface.

We have four sealed membrane keyboards, all of which are liquid-resistant with snap-disc keys. **#OIX 4101** is a vertical membrane keyboard, 3RU/5.25" high & only 1.2" deep. Please call our **Fax-on-Demand** system for datasheets with more detail.



Compact Desktop & Panel-Mount

The **OIX 2000** series of compact keyboards save an amazing 60% of the space normally used by equivalent standard keyboards without the loss of functionality or the ability to touch type. They are ideal for applications where desktop space is at a premium. Operating Temperature: -18° to +131°F (-28° to +55°C). For details on other models, call Fax-on-Demand.

#OIX 2010D	100-Key, NEMA-1 Desk Model Compact Keyboard	**$125**
#OIX 2011G	93-Key, NEMA-1 Desk Keyboard w/Glidepoint™ pointing device	**$225**
#OIX 2015D	100-Key, NEMA-1 Desk Model Keyboard (Industrial Duty)	**$175**
#OIX 2020	100-Key, NEMA-1 Flat Tray Model Keyboard (Industrial Duty)	**$175**
#OIX 2030	100-Key, NEMA-1 Panel-Mount Keyboard (Industrial Duty)	**$175**

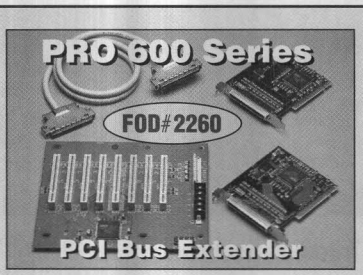
Ordering Information: **Call Fax-on-Demand: Keyboard Index – FOD#2800**

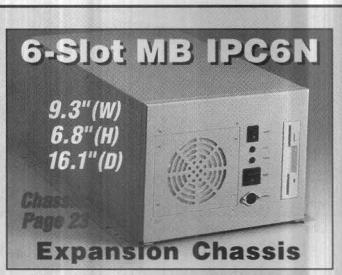
#OIX 7114	Industrial Rack-Mt Keyboard w/Micro-Hulapoint™	**$695**
#OIX 7114R	Model **#7114** Keyboard (Purch. with a Computer)	**$650**
#OIX 1410	Industrial Rack-Mount Keyboard with Trackball	**$545**
#OIX 1410R	Model **#1410** Keyboard (Purchased with a Computer)	**$500**
#OIX 6010	19" Heavy-Duty Rack-Mount Keyboard	**$395**
#OIX 6010R	Model **#6010** Keyboard (Purchased with a Computer)	**$350**
#OIX 1310	Low-Cost Rack-Mount Keyboard with Trackball	**$295**
#OIX 1310R	Model **#1310** Keyboard (Purchased with a Computer)	**$250**
#OIX 4101	NEMA 4X 101-key Sealed Membrane Keyboard w/speaker, Vertical Rack/Panel-Mt, 5.25" Tall, 1.19" Deep (liquid-resistant w/snap-disc keys)	**$295**
#OIX 4107	104-key Sealed Membrane Desktop Kbd w/Touchpad	**$295**
#OIX 4110	105-key Sealed Membrane Rack-Mt. Kbd w/Touchpad	**$395**
#OIX 4053	53-Key NEMA 4X Membrane Kbd., 7.5x4.7x1.45" (emulates 88-key)	**$250**
#OIX 2107	Standard Keyboard (desktop 101-key model, not rack-mount)	**$59**

Save when you purchase a rack-mount keyboard with a CyberResearch rack-mount computer. When you order the "R" version rack-mount keyboard, it will be supplied with your computer in place of the standard keyboard.

Quantity Discounts: 1-4/List 5-9/5% 10-24/10% 25-49/15% **Quantities of a Single Item Per Shipment – Call for Details**

Expansion Chassis • Rack-Mount Printers • DiskOnChip • Anti-Vibration Frames • and more





Pro Series Expansion Chassis

Has your PC run out of slots? Our **PRO 400** ISA-bus Expansion Card Kit is the solution. It's available separately, or with a variety of expansion chassis including MicroBox, table-top, or rack-mount.

The PRO 400 Card Set for ISA-bus PCs includes an Extender & a Receiver Card with a 3-ft interconnect cable. Call for info on the **PRO 600 PCI-bus Extender**.

PCMCIA Expansion Chassis

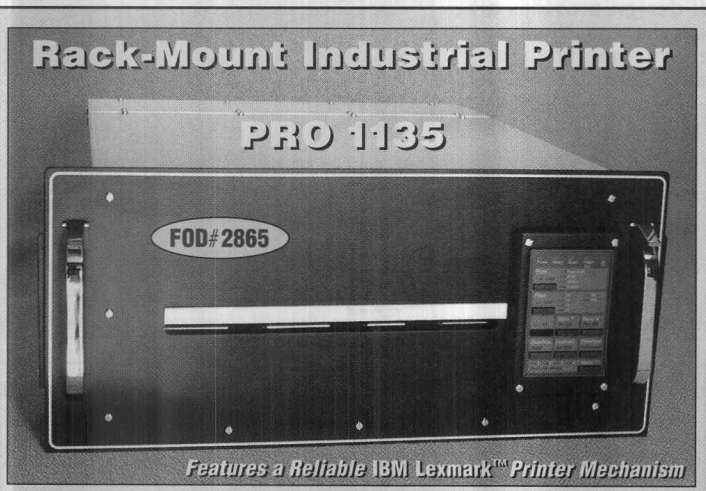
Now you can expand the functionality of your notebook PC with full size ISA-bus boards.

The **PRO 300** PCMCIA-to-ISA Bus Extender Card Set will connect your notebook's PCMCIA type II connector to an ISA-Bus passive backplane chassis. Includes: an Extender Card (5V, 100mA) and a Receiver Card (5V, 300mA) with a 1.6-foot interconnect cable.

Ordering Information: **Call Fax-on-Demand for more information**

#PRO 600 PCI-Bus Extender Card Set w/cable & 8-slot backplane ...**$800**
#PRO 400 ISA-Bus Extender Card Set* w/3-ft cable set.....**$600**
#PRO 300 PCMCIA-to-ISA Bus Ext. Card Set* w/1.6-ft cable set.....**$600**
#PRO 406N 6-Slot ISA Bus Ext. Card Set w/MicroBox IPC6N Chassis..**$895**
#PRO 608R 8-Slot PCI Bus Ext. Card Set w/Chassis, (200W P.S.).....**$1195**

Partial List of Limitations: *With the **PRO 400** ISA Bus Extender Card Set: locate any bus-mastering boards in host computer, not in the expansion chassis.*
PRO 600: *CPU BIOS must support 3 levels of PCI bridging. 33MHz max. bus clock.*
*With the **PRO 300** PCMCIA-to-ISA Bus Extender Card Set: 8-bit data transfers only (not 16-bit), no DMA transfers, no memory map addressing – call for full info.*
Use with any Passive Backplane Chassis. **1 slot required for Extender Card.*



CyberResearch Ruggedized Rack-Mount Dot-Matrix Printer

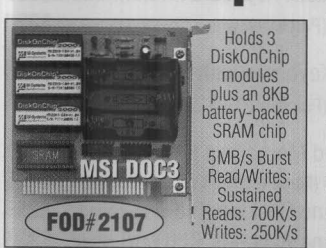
The **PRO 1135** is built around an IBM-made Lexmark printer. This rugged 19" Rack-Mount features a 9-pin printhead (24-pin upgrade optional). It features an all-metal enclosure with hinged lid which encloses and protects printer mechanism. Full-travel heavy-duty ball bearing slides make access easy for paper and ribbon changes. Paper tray offers 1000-sheet capacity, and uses standard tractor-feed paper. Easy-change snap-in ribbon cartridge.

Emulations supported: IBM Pro-printer, IBM Execjet, & Epson FX-850/LQ-850. Parallel interface is standard (RS-232/422 optional). An 8K print buffer keeps ahead of most print tasks, freeing up your PC. Size: 19"W x 8.75"H (5RU) x 19"D. Weight: 26 lbs. (11.8 kg).

Ordering Information: **Call Fax-on-Demand for more info: FOD# 2865**

#PRO 1134 Rugged Factory-Floor Dot Matrix Printer, 9-pin.....**$1295**
#PRO 1135 Industrial Rack-Mount Dot Matrix Printer, 9-pin ...**$1350**

DiskOnChip® Solid State Disk Modules



Holds 3 DiskOnChip modules plus an 8KB battery-backed SRAM chip

5MB/s Burst Read/Writes; Sustained Reads: 700K/s Writes: 250K/s

These chip-size solid-state disk modules emulate a hard drive by providing high-speed data storage with no mechanical parts – perfect for unattended operations and rough environments. Available in sizes of 2 to 24MB (future sizes to 72MB or more).

Many of our CPU cards (pp. 36-38) have sockets to accommodate a DiskOnChip module. Our **MSI DOC3** board accepts up to 3 modules to support multiple drives. If an 8KB SRAM chip is installed, 3 AA batteries provide back-up for the SRAM.

#MSI DOC3 Mounting Board for 3 DiskOnChip Modules.....**$149**

#DOC 2202 2MB DiskOnChip Solid-State Disk Module.....**$100**
#DOC 2204 4MB DiskOnChip Solid-State Disk Module.....**$140**
#DOC 2208 8MB DiskOnChip Solid-State Disk Module.....**$230**
#DOC 2212 12MB DiskOnChip Solid-State Disk Module.....**$300**
#DOC 2224 24MB DiskOnChip Solid-State Disk Module.....**$550**
#SRAM 8K 8KB SRAM Chip (requires batteries to preserve data).....**$Call**

NEW!

Avoid HDD Failures!

Protect your data from sudden disaster. The **MSI AVF25** and **35 Anti-vibration Hard Drive Chassis** utilize a patented vibration-resistant design with long-life silicon plastic components to isolate your hard disk drives from side-shock and vibration.

Specifications: Vibration (operating) 5 to 20Hz, 5.0Gs peak-to-peak, 60 to 200Hz 30Gs peak-to-peak. Shock (operating): 50Gs peak acceleration (10ms duration). Operating Temperature: 32 to 158°F (0 to 70°C). The **MSI AVF25** and **35** utilize standard dimensions and mounting holes to fit most hard drives.

Call Fax-on-Demand for more info 203-483-9966: **FOD#2880.**

#MSI AVF25 2.5" Hard Drive Anti-Vibration Chassis (3.5" Drive Bay).....**$40**
#MSI AVF35 3.5" Hard Drive Anti-Vibration Chassis (5.25" Drive Bay).....**$40**

CyberResearch Assistance: Toll-Free 1-800-341-2525 (USA) Tel: 203-483-8815 Fax: 203-483-9024
Applications Engineers: Mon-Fri, 9AM-5PM U.S. Eastern Time • **Internet Website:** http://www.cyberresearch.com • **Fax-on-Demand System:** 203-483-9966 • **BBS:** 203-488-8949

Monitor & Keyboard Extenders: Extend Your Monitor, Keyboard, & Mouse Up To 250 Feet Away from Your PC

Our "**Extender Plus Series**" allows you to locate your monitor and keyboard anywhere within a 250-foot radius of your PC, much like an extension cord. Virtually every PC monitor is supported. The **Companion-Plus** allows you to operate a single PC locally, as well as remotely. Connect a local keyboard, monitor, and mouse to your PC, *as well as* another keyboard, monitor, and mouse up to 250 feet away. You can switch at any time from "shared" mode — where both monitors & keyboards are active — to "private" mode where the remote terminal is turned off. This switch is located on the box at the local site. *Please note that this is not a multi-tasking system. Your PC will still be able to execute only one task at a time, and both monitors will always display the same thing at the same time.* It supports VGA monitors up to 1024 x 768 resolution, a PS/2 or serial mouse, and a keyboard at both locations. Our **Multiport *Expander*** adds 1 to 7 keyboards and monitors to your PC. It's a multiport video buffer and electronic keyboard switch which provides **up to 250 feet of extension** for multiple keyboards and monitors connected to a single PC.

To configure the **Extender** or **Companion Series,** choose a set of interface boxes, and a cable to go in between them. Each set contains two interface boxes, one for each end of the connection. The interface boxes contain plugs for all necessary connections, and each plug is unique, so there is no way to plug anything in wrong. **No software is required**. Just plug in the cables and you're ready to run. Standard cables are Belden PVC. Plenum-rated cables are teflon-coated and fire-resistant for routing through heating ducts & firewalls.

Ordering Information: **Extender/Companion/Expander Products** **FOD#2901**

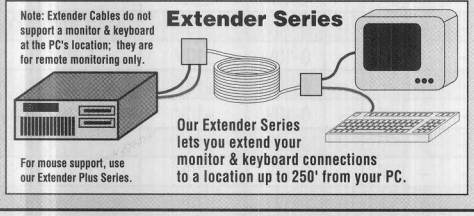
#CBX PCM	Companion Plus Int. Set: Hi-Res. SVGA (0-250 ft.) w/Mouse Support	**$495**
#CBX CPW	Companion Interface Set: Hi-Res. SVGA (0-250 ft.)	**$450**
#CBX CPV	Companion Interface Set: VGA (0-150 ft., 640x480)	**$295**
#CBX PEM	Extender Plus Int. Set: Hi-Res. SVGA (0-250 ft. Range) w/Mouse Support	**$395**
#CBX EXW	Extender Interface Set: Hi-Res. SVGA (0-250 ft. Range)	**$395**
#CBX EXV	Extender Interface Set: VGA (0-150 ft. Range, 640x480)	**$195**
#CBX PXM4	Expander Plus 4-Port SVGA Transmitter*	**$495**
#CBX PR	Expander Plus Receiver Box: SVGA**	**$200**

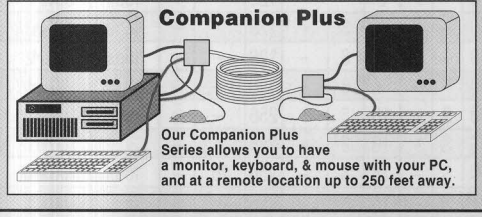
* *To attach up to 4 keyboards, mice, & monitors to one PC. (Use CBX PXM8 $995 to attach up to 8)*

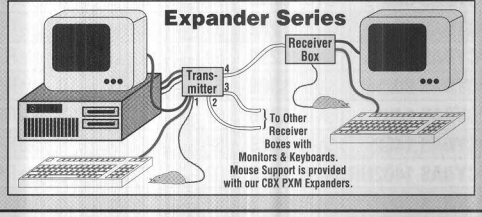
** *Quantity 1 receiver required for use with each monitor/keyboard/mouse, at far end of cable.*

Cables (one cable required per Interface Set/Receiver Box) **Plenum-Rated cable available.**

#CBX CM25	25' Standard Cable	**$45**	**#CBX CM150**	150' Standard Cable	**$150**
#CBX CM50	50' Standard Cable	**$65**	**#CBX CM200**	200' Standard Cable	**$200**
#CBX CM100	100' Standard Cable	**$100**	**#CBX CM250**	250' Standard Cable	**$250**







Need More Information on CyberResearch PC Accessories? Call or FAX for Detailed Product Specifications and Prices.

DataPak™ Removable Hard Disk Drive Modules

Protect your data from theft or unauthorized use. Remove your hard drive without shutting down your PC and lock it up in a secure place.

- Fits 5.25" half-height bay
- Supports 3.5" hard drives
- IDE or SCSI Interfaces
- SCSI ID Selector Switch
- Hot Drive Removability
- Key Lock ON/OFF
- Fan Cooling
- Aluminum Frame
- Activity LEDs
- Power/Drive LED

Cast Aluminum Frame with a built-in fan for cooling. Pull-out module made from cast aluminum & steel, completely encloses and protects hard drive. Call *Fax-on-Demand* for more info.

#HDDM 220	Removable DataPak Kit, mounts 3.5" IDE in a 5.25" bay	**$95**
#HDDM 220S	Removable DataPak Kit, mounts 3.5" SCSI in a 5.25" bay	**$99**
#HDDM 121	Extra IDE Drive Module, holds one 3.5" IDE hard drive	**$50**
#HDDM 121S	Extra SCSI Drive Module, holds one 3.5" SCSI hard drive	**$50**
#HDDM 122	Extra IDE Mounting Bay, accepts IDE drive module	**$50**
#HDDM 122S	Extra SCSI Mounting Bay, accepts SCSI drive module	**$55**
#HDDM 123	Carrying Case for Removable Module (121 or 121S)	**$25**

Each DataPak Kit includes: a Hard Disk Drive Module (either IDE or SCSI, which holds your hard disk drive mechanism), a 5.25" Mounting Bay (which stays in your computer), and cables.

Quantity Discounts: 5-9/5%, 10-24/10%, 25-49/15% **Call for more information.**

High-Reliability Hard Disk Drives

#MSI 25140	1.4 GigaByte 2.5" IDE Hard Disk Drive (6.43 ms)	**$295**
#MSI 25200	2.0 GigaByte 2.5" IDE Hard Disk Drive (5.7 ms)	**$450**
#MSI 25300	3.0 GigaByte 2.5" IDE Hard Disk Drive (5.7 ms)	**$695**
#MSI 21000C	1.6 GB (1600 MB) 3.5" IDE Hard Drive (purchased with a system)	**$250**
#MSI 22000	2.1 GigaByte (2100 MB) 3.5" IDE Hard Drive (12 ms)	**$350**
#MSI 23000	3.1 GigaByte (3100 MB) 3.5" IDE Hard Drive (12 ms)	**$395**
#MSI 24000	4.3 GigaByte (4300 MB) 3.5" IDE Hard Drive (11.5 ms)	**$495**
#MSI 27000	7.0 GigaByte (7000 MB) 3.5" IDE Hard Drive (11.5 ms)	**$695**
#MSI 32000	2.1 GB (2100 MB) 3.5" SCSI Hard Drive (10 ms)	**$395**
#MSI 34000	4.3 GB (4300 MB) 3.5" SCSI Hard Drive (10 ms)	**$595**
#MSI 36000	6.4 GB (6400 MB) 3.5" SCSI Hard Drive (10 ms)	**$795**
#MSI 3900W	9.1 GB (9100 MB) 3.5" Ultra Wide SCSI-3 Hard Drive (8 ms)	**$1295**

CD-ROM Drives

#MSI CDI	IDE 5.25" CD-Rom Drive (20x Speed, minimum)	**$100**
#MSI CDS	SCSI 5.25" CD-Rom Drive (16x Speed, minimum)	**$200**

SCSI Controller Cards

#MSI 1542C	ISA-Bus Fast SCSI II Controller Card	**$295**
#MSI 2940	PCI-Bus Fast SCSI II Controller Card	**$295**
#MSI 2940UW	PCI-Bus Ultra Wide SCSI-3 Controller Card	**$395**

A SCSI Controller Card is required to use a SCSI hard disk drive or CD-ROM drive.

Metal-Frame Removable Hard Drives for Added Security

Add **–R** to the hard drive part number, and we'll mount it in one of our DataPak™ Removable Hard Disk Drive Modules (see box at left, price *includes* module)....**$100**

Analog Input Boards

Continued on Next Page

Part #	Bus	Price	Page Number for More Information	Fax-on-Demand Info # (203-483-9966)	Resolution	On-Board Memory Buffer (1 Word = 1 Sample)	DMA Modes Available (Single/Dual)	On-Board Microprocessor	Single-Ended	Differential	Single-Ended with Multiplexer	Differential with Multiplexer	Simultaneous Sampling	Cold Junction Comp. Channel	A/D Converter Speed	Maximum Sample Rate	Current Inputs	Autoranging	Software-Selectable Ranges	Individual Gain/Channel	Unipolar Inputs	Bi-Polar Inputs	Gains
			General Specifications						**Number of Channels**						**Speed**						**Input Ranges**		
#CYDAS 8JR	ISA-8	$99	59	FOD# 3010	12 bits	–	–	–	8	–	–	128	–	–	25µs	1kHz	–	–	–	–	–	±5V	–
#CYDAS 8JRAO	ISA-8	$149	59	FOD# 3010	12 bits	–	–	–	8	–	–	128	–	–	25µs	1kHz	–	–	–	–	–	±5V	–
#CYDAS 8JRHR	ISA-8	$199	59	FOD# 3019	16 bits	–	–	–	8	–	–	128	–	–	30ms	33Hz	–	–	–	–	–	±5V	–
#CYDAS 8JRAOHR	ISA-8	$299	59	FOD# 3019	16 bits	–	–	–	8	–	–	128	–	–	30ms	33Hz	–	–	–	–	–	±5V	–
#CYDAS 8	ISA-8	$185	59	FOD# 3011	12 bits	–	–	–	8	–	–	128	–	–	25µs	20kHz	–	–	–	–	0-10V	± 5, 10V	–
#CYDAS 8PGL	ISA-8	$345	59	FOD# 3012	12 bits	–	–	–	8	8	–	128	–	–	25µs	20kHz	–	–	Y	–	0-10V	± 5, 10V	1, 2, 4, 8
#CYDAS 8PGM	ISA-8	$345	59	FOD# 3012	12 bits	–	–	–	8	8	–	128	–	–	25µs	20kHz	–	–	Y	–	0-10V	± 5, 10V	1, 10, 100, 500
#CYDAS 8PGH	ISA-8	$345	59	FOD# 3012	12 bits	–	–	–	8	8	–	128	–	–	25µs	20kHz	–	–	Y	–	0-10V	± 5, 10V	(0.5),1, (5), 10, (50), 100, (500), 1000
#CYDAS 8AOL	ISA-8	$395	59	FOD# 3013	12 bits	–	–	–	8	8	–	128	–	–	25µs	20kHz	–	–	Y	–	0-10V	± 5, 10V	1, 2, 4, 8
#CYDAS 8AOM	ISA-8	$395	59	FOD# 3013	12 bits	–	–	–	8	8	–	128	–	–	25µs	20kHz	–	–	Y	–	0-10V	± 5, 10V	1, 10, 100, 500
#CYDAS 8AOH	ISA-8	$395	59	FOD# 3013	12 bits	–	–	–	8	8	–	128	–	–	25µs	20kHz	–	–	Y	–	0-10V	± 5, 10V	(0.5),1, (5), 10, (50), 100, (500), 1000
#CYDAS 16/16F	ISA-8	$785 $845	59	FOD# 3014	12 bits	1-Sample FIFO	S	–	16	8	–	256	16[A]	–	**16**: 15µs **16F**: 8.5µs	**16**: 50kHz **16F**: 100kHz	–	–	–	–	0-10V	±10V	1, 2, 5, 10
#CYDAS 16JR	ISA-8	$349	59	FOD# 3015	12 bits	1-Sample FIFO	S	–	16	8	–	256	16[A]	–	3µs	120kHz	–	–	–	–	0-10V	± 5, 10V	1, 2, 4, 8
#CYDAS 16JRHR	ISA-8	$449	59	FOD# 3015	16 bits	1-Sample FIFO	S	–	16	8	–	256	16[A]	–	10µs	100kHz	–	–	–	–	0-10V	±10V	1, 2, 4, 8
#CYDAS 16JRC	ISA-8	$499	59	FOD# 3015	12 bits	1-Sample FIFO	S	–	16	8	–	256	16[A]	–	3µs	120kHz	–	–	–	–	0-10V	± 5, 10V	1, 2, 4, 8
#CYDAS 24I	ISA-8	$399	Call	FOD# 3016	12 bits	–	–	–	–	24	–	–	–	–	25µs	20kHz	Y	–	–	–	4-20mA	–	1, 2, 4, 8
#CYDAS 48	ISA-8	$399	Call	FOD# 3016	12 bits	–	–	–	48	24	–	–	–	–	25µs	20kHz	–	–	–	–	0-10V	± 5, 10V	1, 2, 4, 8
#CYDAS 800	ISA-8	$249	59	FOD# 3017	12 bits	256-Sample FIFO	–	–	8	–	–	128	–	–	15µs	50kHz	–	–	–	–	0-5V	±5V	–
#CYDAS 801	ISA-8	$299	59	FOD# 3017	12 bits	256-Sample FIFO	–	–	8	8	–	128	–	–	15µs	50kHz	–	–	Y	–	0-10V	±10V	1, 10, 100, 1000
#CYDAS 802	ISA-8	$299	59	FOD# 3017	12 bits	256-Sample FIFO	–	–	8	8	–	128	–	–	15µs	50kHz	–	–	Y	–	0-10V	±10V	1, 2, 4, 8
#CYDAS 802HR	ISA-8	$399	59	FOD# 3017	16 bits	256-Sample FIFO	–	–	8	8	–	128	–	–	10µs	100kHz	–	–	Y	–	0-10V	±10V	1, 2, 4, 8
#CYDAS 1401	ISA-8	$385	62	FOD# 3018	12 bits	512-Sample FIFO	S	–	16	8	–	256	–	–	3µs	160kHz	–	–	Y	–	0-10V	±10V	1, 10, 100, 1000
#CYDAS 1402	ISA-8	$385	62	FOD# 3018	12 bits	512-Sample FIFO	S	–	16	8	–	256	–	–	3µs	160kHz	–	–	Y	–	0-10V	±10V	1, 2, 4, 8
#CYDAS 1402HR	ISA-8	$485	62	FOD# 3018	16 bits	512-Sample FIFO	S	–	16	8	–	256	16[A]	–	10µs	100kHz	–	–	Y	–	0-10V	±10V	1, 2, 4, 8
#CYDAS 1601	ISA-8	$585	62	FOD# 3020	12 bits	512-Sample FIFO[D]	S	–	16	8	–	256	16[A]	–	3µs	160kHz	–	–	Y	–	0-10V	±10V	1, 10, 100, 1000
#CYDAS 1602	ISA-8	$585	62	FOD# 3020	12 bits	512-Sample FIFO[D]	S	–	16	8	–	256	16[A]	–	3µs	160kHz	–	–	Y	–	0-10V	±10V	1, 2, 4, 8
#CYDAS 1602HR	ISA-8	$685	62	FOD# 3020	16 bits	512-Sample FIFO[D]	S	–	16	8	–	256	16[A]	–	10µs	100kHz	–	–	Y	–	0-10V	±10V	1, 2, 4, 8
#CYDAS 1802M1	ISA	$999	59	FOD# 3022	12 bits	1024-Sample FIFO[D]	S	–	–	8	–	–	–	–	0.8µs	1MHz	–	–	Y	–	0-10V	± 5, 10V	1, 2, 4, 8
#CYDAS 1802ST	ISA	$599	59	FOD# 3023	12 bits	1024-Sample FIFO[D]	S	–	16	8	–	256	16[A]	–	3µs	330kHz	–	–	Y	–	0-10V	± 5, 10V	1, 2, 4, 8
#CYDAS 6402	ISA	$799	6D	FOD# 3064	12 bits	1024-Sample FIFO	S	–	64	32	–	–	–	–	3µs	333kHz	–	–	Y	–	0-10V	±10V	1, 2, 4, 8
#CYDAS 6402HR	ISA	$999	6D	FOD# 3064	16 bits	1024-Sample FIFO	S	–	64	32	–	–	–	–	5µs	100kHz	–	–	Y	–	0-10V	±10V	1, 2, 4, 8
#CYDAS 1602PHR	PCI	$1195	Call	FOD# 3021	16 bits	512-Sample FIFO[D]	–	–	16	8	–	256	16[A]	–	10µs	200kHz	–	–	Y	–	0-10V	±10V	1, 2, 4, 8
#PCYDAS 1208D	PCM	$445	Call	FOD# 4114	12 bits	512 Samples	–	–	–	8	–	–	–	–	10µs	100kHz	–	–	Y	–	0-10V	± 10V	1, 2, 4, 8
#PCYDAS 1216S	PCM	$445	Call	FOD# 4114	12 bits	512 Samples	–	–	16	–	–	–	–	–	10µs	100kHz	–	–	Y	–	0-10V	± 10V	1, 2, 4, 8
#PCYDAS 1608D	PCM	$545	Call	FOD# 4114	16 bits	512 Samples	–	–	–	8	–	–	–	–	10µs	100kHz	–	–	Y	–	0-10V	± 10V	1, 2, 4, 8
#PCYDAS 1616S	PCM	$545	Call	FOD# 4114	16 bits	512 Samples	–	–	16	–	–	–	–	–	10µs	100kHz	–	–	Y	–	0-10V	± 10V	1, 2, 4, 8
#PCYDAS 8	PCM	$295	Call	FOD# 4112	12 bits	–	–	–	8	–	–	–	–	–	25µs	25kHz	–	–	–	–	–	± 5V	–
#DAP 800/102	ISA-8	$1195	Call	FOD# 3028	12 bits	128K Samples	–	Y	8	4	32	16	–	–	9.5µs	105kHz	–	Y	–	Y	0-5V	± 2.5, 5, 10V	1, 10, 100, 500
#DAP 800/103	ISA-8	$1395	Call	FOD# 3028	12 bits	512K Samples	–	Y	8	4	32	16	–	–	9.5µs	105kHz	–	Y	–	Y	0-5V	± 2.5, 5, 10V	1, 10, 100, 500
#DAP 1200A/4	ISA	$1995	Call	FOD# 3029	12 bits	512K Samples	–	Y	16	8	512	256	256[A]	–	6µs	166kHz	–	Y	–	Y	0-5V	± 5, 10V	1, 10, 100, 500
#DAP 1200A/6	ISA	$2195	Call	FOD# 3029	12 bits	512K Samples	–	Y	16	8	512	256	256[A]	–	3.2µs	312kHz	–	Y	–	Y	0-5V	± 5, 10V	1, 10, 100, 500
#DAP 1216A/4	ISA	$2295	Call	FOD# 3029	16 bits	512K Samples	–	Y	16	8	64	32	–	–	10µs	100kHz	–	Y	–	Y	–	± 5, 10V	1, 10, 100, 500
#DAP 3000A/111	ISA	$2195	Call	FOD# 3030	12 bits	256K Samples	–	Y	16	8	512	256	256[A]	–	3µs	333kHz	–	Y	–	Y	0-5V	± 2.5, 5, 10V	1, 10, 100, 500
#DAP 3000A/212	ISA	$2595	Call	FOD# 3030	12 bits	1M Samples	–	Y	16	8	512	256	256[A]	–	1.3µs	769kHz	–	Y	–	Y	0-5V	± 2.5, 5, 10V	1, 10, 100, 500
#DAP 3200A/315	ISA	$3795	Call	FOD# 3031	12 bits	2M Samples	–	Y	16	8	512	256	256[A]	–	1.3µs	769kHz	–	Y	–	Y	0-5V	± 2.5, 5, 10V	1, 10, 100, 500
#DAP 3200A/415	ISA	$4095	Call	FOD# 3031	12 bits	2M Samples	–	Y	16	8	512	256	256[A]	–	1.3µs	769kHz	–	Y	–	Y	0-5V	± 2.5, 5, 10V	1, 10, 100, 500
#DAP 3216A/415	ISA	$4395	Call	FOD# 3031	16 bits	2M Samples	–	Y	16	8	512	256	256[A]	–	5µs	200kHz	–	Y	–	Y	–	± 5, 10V	1, 10, 100, 500
#DAP 3400A/445	ISA	$4995	Call	FOD# 3032	12 bits	4M Samples	–	Y	16	8	512	256	–	–	1.25µs	3.2MHz	–	Y	–	Y	–	± 2.5, 5V	–
#DASP 50H/L	Par	$695	Call	FOD# 3054	12 bits	1024 Samples	–	–	16	8	–	–	–	–	10µs	100kHz	–	–	Y	Y	0-5, 10V	± 5, 10V	**DASP 50H**: 1, 10, 100 **DASP 50L**: 1, 2, 4, 8
#DASP 50HA/LA	Par	$795	Call	FOD# 3054	12 bits	1024 Samples	–	–	16	8	–	–	–	–	10µs	100kHz	–	–	Y	Y	0-5, 10V	± 5, 10V	**DASP 50HA**: 1, 10, 100 **DASP 50LA**: 1, 2, 4, 8

Bus: ISA = ISA 16-bit (AT) Slot; **ISA-8** = Use in any ISA Slot: 8-bit (XT) or 16-bit (AT); **PCI** = PCI Expansion Slot; **PCM** = PCMCIA Type II Slot; **PC/104** = PC/104 Expansion Connector; **Ser** = Serial (RS-232) Port; **Par** = Parallel (Printer) Port.

A: These boards offer simultaneous sampling via an optional external sample & hold panel. For *CyDAS*, see page 65.

C: **CYDAS 8JR** & **8JRAO** are limited to 1kHz with the CYDAS-LABTECH Solution version of NOTEBOOK software. For faster applications up to the max. speed of the board, purchase the full LABTECH NOTEBOOK package (pg 76).

DATA ACQUISITION COMPARISON CHART

	Trigger Modes					Noise Rejection			Analog Outputs						Digital I/O			Software Compatibility										
	Pretrigger	Analog Slope	External Pulse	Software	Counter/Timer	Common Mode Rejection Ratio	Normal Mode Rejection Ratio	Number of D/A Channels	Unipolar D/A Ranges	Bi-Polar D/A Ranges	D/A Range Select	D/A Conversion Speed	Counter/Timer Channels	Number of Digital I/O Lines	Input/Output Select	Output Current Sink	Included Free with Board	Labtech Notebook/Control	SnapMaster	Universal Driver Library	HP VEE	Windows NT	DASYLab	WorkBench	TestPoint	LabWindows	LabVIEW	Part #
	–	–	–	Y	–	–	–	–	–	–	–	–	–	8 in/8 out	Fixed	24mA	Diagnostic S/W	Y[C]	–	Y	Y	–	Y	–	–	–	Y	**#CYDAS 8JR**
	–	–	–	Y	–	–	–	2	–	±5V	–	100kHz	–	8 in/8 out	Fixed	24mA	Diagnostic S/W	Y[C]	–	Y	Y	–	Y	–	–	–	Y	**#CYDAS 8JRAO**
	–	–	–	Y	–	–	–	–	–	–	–	–	–	8 in/8 out	Fixed	24mA	Diagnostic S/W	Y[C]	–	Y	Y	–	Y	–	–	–	Y	**#CYDAS 8JRHR**
	–	–	–	Y	–	–	–	2[F]	–	±5V	–	100kHz	–	8 in/8 out	Fixed	24mA	Diagnostic S/W	Y[C]	–	Y	Y	–	Y	–	–	–	Y	**#CYDAS 8JRAOHR**
	–	–	Y	Y	Y	–	–	–	–	–	–	–	3	2x8-bit, 2x4-bit, 3 in, & 4 out	Software	24 @ 2.5, 4 @ 8mA	Diagnostic S/W	Y	Y	Y	Y	–	Y	–	–	–	Y	**#CYDAS 8**
	–	–	Y	Y	Y	–	–	–	–	–	–	–	3	3 in/4 out	Software	2.5 mA	Diagnostic S/W	Y	Y	Y	Y	–	Y	–	–	–	Y	**#CYDAS 8PGL**
	–	–	Y	Y	Y	–	–	–	–	–	–	–	3	3 in/4 out	Software	2.5 mA	Diagnostic S/W	Y	Y	Y	Y	–	Y	–	–	–	Y	**#CYDAS 8PGM**
	–	–	Y	Y	Y	–	–	–	–	–	–	–	3	3 in/4 out	Software	2.5 mA	Diagnostic S/W	Y	Y	Y	Y	–	Y	–	–	–	Y	**#CYDAS 8PGH**
	–	–	Y	Y	Y	–	–	2	0-5, 10V	±2.5, 5, 10V	Switch	250kHz	3	2x8-bit, 2x4-bit, 3 in, & 4 out	Software	24 @ 2.5, 4 @ 8mA	Diagnostic S/W	Y	Y	Y	Y	–	Y	–	–	–	Y	**#CYDAS 8AOL**
	–	–	Y	Y	Y	–	–	2	0-5, 10V	±2.5, 5, 10V	Switch	250kHz	3	2x8-bit, 2x4-bit, 3 in, & 4 out	Software	24 @ 2.5, 4 @ 8mA	Diagnostic S/W	Y	Y	Y	Y	–	Y	–	–	–	Y	**#CYDAS 8AOM**
	–	–	Y	Y	Y	–	–	2	0-5, 10V	±2.5, 5, 10V	Switch	250kHz	3	2x8-bit, 2x4-bit, 3 in, & 4 out	Software	24 @ 2.5, 4 @ 8mA	Diagnostic S/W	Y	Y	Y	Y	–	Y		–		Y	**#CYDAS 8AOH**
	–	–	Y	Y	Y	–	–	2	0-5, 10V	±10V	Jumper	33kHz	3	2x8-bit, 2x4-bit, 4 in, & 4 out	Software	24 @ 2.5, 4 @ 8mA	Diagnostic S/W	Y	Y	Y	Y	–	Y	–	Y	–	Y	**#CYDAS 16/16F**
	–	–	Y	Y	Y	–	–	–	–	–	–	–	3	4 in/4 out	Fixed	8mA	Diagnostic S/W	Y	Y	Y	Y	–	Y	–	–	–	Y	**#CYDAS 16JR**
	–	–	Y	Y	Y	–	–	–	–	–	–	–	3	4 in/4 out	Fixed	8mA	Diagnostic S/W	Y	Y	Y	Y	–	Y	–	–	–	Y	**#CYDAS 16JRHR**
	–	–	Y	Y	Y	–	–	–	–	–	–	–	3	4 in/4 out	Fixed	8mA	Diagnostic S/W	Y	Y	Y	Y	–	Y	–	–	–	Y	**#CYDAS 16JRC**
	–	–	–	Y	–	–	–	–	–	–	–	–	–	–	–	–	Diagnostic S/W	Y	Y	Y	Y	–	–	–	–	–	Y	**#CYDAS 24I**
	–	–	–	Y	–	–	–	–	–	–	–	–	–	–	–	–	Diagnostic S/W	Y	Y	Y	Y	–	–	–	–	–	Y	**#CYDAS 48**
	–	–	Y	Y	Y	–	–	–	–	–	–	–	3	3 in/4 out	Fixed	8mA	Diagnostic S/W	Y	–	Y	Y	–	Y	–	Y	–	Y	**#CYDAS 800**
	–	–	Y	Y	Y	–	–	–	–	–	–	–	3	3 in/4 out	Fixed	8mA	Diagnostic S/W	Y	–	Y	Y	–	Y	–	Y	–	Y	**#CYDAS 801**
	–	–	Y	Y	Y	–	–	–	–	–	–	–	3	3 in/4 out	Fixed	8mA	Diagnostic S/W	Y	–	Y	Y	–	Y	–	Y	–	Y	**#CYDAS 802**
	–	–	Y	Y	Y	–	–	–	–	–	–	–	3	3 in/4 out	Fixed	8mA	Diagnostic S/W	Y	–	Y	Y	–	Y	–	Y	–	Y	**#CYDAS 802HR**
	–	–	Y	Y	Y	–	–	–	–	–	–	–	3	4 in/4 out	Fixed	8mA	Diagnostic S/W	Y	Y	Y	Y	–	Y	–	Y	–	Y	**#CYDAS 1401**
	–	–	Y	Y	Y	–	–	–	–	–	–	–	3	4 in/4 out	Fixed	8mA	Diagnostic S/W	Y	Y	Y	Y	–	Y	–	Y	–	Y	**#CYDAS 1402**
	–	–	Y	Y	Y	74dB	–	–	–	–	–	–	2	4 in/4 out	Fixed	8mA	Diagnostic S/W	Y	Y	Y	Y	–	Y	–	Y	–	Y	**#CYDAS 1402HR**
	–	–	Y	Y	Y	–	–	2	0-5, 10V	±5, 10V	Jumper	33kHz	3	2x8-bit, 2x4-bit, 4 in, & 4 out	Software	24 @ 2.5 4 @ 8mA	Diagnostic S/W	Y	Y	Y	Y	–	Y	–	Y	–	Y	**#CYDAS 1601**
	–	–	Y	Y	Y	–	–	2	0-5, 10V	±5, 10V	Jumper	33kHz	3	2x8-bit, 2x4-bit, 4 in, & 4 out	Software	24 @ 2.5 4 @ 8mA	Diagnostic S/W	Y	Y	Y	Y	–	Y	–	Y	–	Y	**#CYDAS 1602**
	–	–	Y	Y	Y	74dB	–	2	0-5, 10V	±5, 10V	Jumper	33kHz	2	2x8-bit, 2x4-bit, 4 in, & 4 out	Software	24 @ 2.5 4 @ 8mA	Diagnostic S/W	Y	Y	Y	Y	–	Y	–	Y	–	Y	**#CYDAS 1602HR**
	Y	–	Y	Y	Y	–	–	–	–	–	–	–	3	2x8-bit 2x4-bit	Software	1.7mA	Diagnostic S/W	Y	Y	Y	Y	–	Y	–	–	–	Y	**#CYDAS 1802M1**
	Y	–	Y	Y	Y	–	–	–	–	–	–	–	3	4 in/4 out	Fixed	8mA	Diagnostic S/W	Y	Y	Y	Y	–	Y	–	–	–	Y	**#CYDAS 1802ST**
	Y	–	Y	Y	Y	–	–	2	0-2.5, 5, 10V	±2.5, 5, 10V	Software	200kHz	3	8 in/8 out	Fixed	8mA	Diagnostic S/W	Y	–	Y	Y	–	–	–	Y	–	Y	**#CYDAS 6402**
	Y	–	Y	Y	Y	–	–	2[F]	0-2.5, 5, 10V	±2.5, 5, 10V	Switch	50kHz	3	8 in/8 out	Fixed	8mA	Diagnostic S/W	Y	–	Y	Y	–	–	–	Y	–	Y	**#CYDAS 6402HR**
	–	–	Y	Y	Y	74dB	–	2	0-5, 10V	±5, 10V	Jumper	33kHz	2	2x8-bit 2x4-bit	Software	2.5mA	Diagnostic S/W	Y	–	Y	Y	–	Y	–	–	–	Y	**#CYDAS 1602PHR**
	–	–	Y	Y	Y	–	–	–	–	–	–	–	3	2x4-bit	Software	1.7mA	Install & Test	Y	Y	Y	Y	–	Y	–	–	–	Y	**#PCYDAS 1208D**
	–	–	Y	Y	Y	–	–	–	–	–	–	–	3	2x4-bit	Software	1.7mA	Install & Test	Y	Y	Y	Y	–	Y	–	–	–	Y	**#PCYDAS 1216S**
	–	–	Y	Y	Y	–	–	–	–	–	–	–	3	2x4-bit	Software	1.7mA	Install & Test	Y	Y	Y	Y	–	Y	–	–	–	Y	**#PCYDAS 1608D**
	–	–	Y	Y	Y	–	–	–	–	–	–	–	3	2x4-bit	Software	1.7mA	Install & Test	Y	Y	Y	Y	–	Y	–	–	–	Y	**#PCYDAS 1616S**
	–	–	Y	Y	–	–	–	–	–	–	–	–	–	3 in/3 out	Fixed	1.7mA	Install & Test	–	Y	Y	Y	–	–	–	–	–	Y	**#PCYDAS 8**
	Y	Y	Y	Y	Y	90-96dB	–	2	0-10V	±5, 10V	Jumper	105kHz	–	8 in/8 out	Fixed	24mA	DAPview S/W	Y	–	–	–	Y	Y	–	–	CVI	Y	**#DAP 800/102**
	Y	Y	Y	Y	Y	90-96dB	–	2	0-10V	±5, 10V	Jumper	105kHz	–	8 in/8 out	Fixed	24mA	DAPview S/W	Y	–	–	–	Y	Y	–	–	CVI	Y	**#DAP 800/103**
	Y	Y	Y	Y	Y	90-96dB	–	2	0-10V	±5, 10V	Jumper	166kHz	–	16 in/16 out	Fixed	24mA	DAPview S/W	Y	–	–	–	Y	Y	–	–	CVI	Y	**#DAP 1200A/4**
	Y	Y	Y	Y	Y	90-96dB	–	2	0-10V	±5, 10V	Jumper	312kHz	–	16 in/16 out	Fixed	24mA	DAPview S/W	Y	–	–	–	Y	Y	–	–	CVI	Y	**#DAP 1200A/6**
	Y	Y	Y	Y	Y	96dB	–	2[F]	–	±5, 10V	Jumper	166kHz	–	16 in/16 out	Fixed	24mA	DAPview S/W	Y	–	–	–	Y	Y	–	–	CVI	Y	**#DAP 1216A/4**
	Y	Y	Y	Y	Y	90-96dB	–	2	0-5V	±2.5, 5, 10V	Jumper	333kHz	–	16 in/16 out	Fixed	24mA	DAPview S/W	Y	–	–	–	Y	Y	–	–	CVI	Y	**#DAP 3000A/111**
	Y	Y	Y	Y	Y	90-96dB	–	2	0-5V	±2.5, 5, 10V	Jumper	833kHz	–	16 in/16 out	Fixed	24mA	DAPview S/W	Y	–	–	–	Y	Y	–	–	CVI	Y	**#DAP 3000A/212**
	Y	Y	Y	Y	Y	90dB	–	2	0-5V	±2.5, 5, 10V	Jumper	833kHz	–	16 in/16 out	Fixed	24mA	DAPview S/W	Y	–	–	–	Y	Y	–	–	CVI	Y	**#DAP 3200A/315**
	Y	Y	Y	Y	Y	90dB	–	2	0-5V	±2.5, 5, 10V	Jumper	833kHz	–	16 in/16 out	Fixed	24mA	DAPview S/W	Y	–	–	–	Y	Y	–	–	CVI	Y	**#DAP 3200A/415**
	Y	Y	Y	Y	Y	90-96dB	–	2[F]	–	±5, 10V	Jumper	500kHz	–	16 in/16 out	Fixed	24mA	DAPview S/W	Y	–	–	–	Y	Y	–	–	CVI	Y	**#DAP 3216A/415**
	Y	Y	Y	Y	Y	96dB	–	–	–	–	–	–	–	–	–	–	DAPview S/W	–	–	–	–	Y	–	–	–	–	Y	**#DAP 3400A/445**
	–	Y	Y	Y	Y	80dB	–	–	–	–	–	–	1	8 in/8 out	Fixed	24mA	DOS, C Drivers	–	–	–	–	–	–	–	–	–	–	**#DASP 50H/L**
	–	Y	Y	Y	Y	80dB	–	2	–	±10V	–	100kHz	1	8 in/8 out	Fixed	24mA	DOS, C Drivers	–	–	–	–	–	–	–	–	–	–	**#DASP 50HA/LA**

D: Maximum 128 Mega-sample data buffer (Max. 134,217,728 Samples) using the DT-FIFO Memory Buffer Card – call for info.
F: **16-bit** Analog Output Channels – 16-bit is 1 part in 65,536; (D/As on most other boards offer 12-bit resolution – 1 part in 4096).

Call: Please call for more information. Availability of hardware drivers listed as "Call" was tentative at press time.

Tel: 203-483-8815 Fax: 203-483-9024
Fax-on-Demand System: 203-483-9966

#DSO 225-02	ISA-8	$**1995**	6A	FOD# **1525**	8 bits	**128KS** on DSO 225-02, Models to 8MS Available	–	–	2	–	–	–	16[H]	–	0.02 µs	50 MHz	–	–	–	Y	–	± 1V	0.2, 1, 2, 5, 10
#DSO 265	ISA	$**3495**	6A	FOD# **1565**	8 bits	256K Samples	–	–	2	–	–	–	16[H]	–	0.01 µs	130 MHz	–	–	–	Y	–	± 1V	0.2, 0.5, 1, 2, 5
#DSO 265-03	ISA	$**3895**	6A	FOD# **1565**	8 bits	**1MS** on DSO 265-03, 4 & 8MS Models Available	–	–	2	–	–	–	16[H]	–	0.01 µs	130 MHz	–	–	–	Y	–	± 1V	0.2, 0.5, 1, 2, 5
#DSO 2125	ISA	$**4995**	6A	FOD# **1515**	8 bits	256K Samples	–	–	2	–	–	–	16[H]	–	8 ps	250 MHz	–	–	–	Y	–	± 1V	0.2, 0.5, 1, 2, 5
#DSO 2125-03	ISA	$**5495**	6A	FOD# **1515**	8 bits	**1MS** on DSO 2125-03, 4 & 8MS Models Available	–	–	2	–	–	–	16[H]	–	8 ps	250 MHz	–	–	–	Y	–	± 1V	0.2, 0.5, 1, 2, 5
#DSO 8500P	PCI	$**6995**	Call	FOD# **1585**	8 bits	128K Samples	–	–	1	–	–	–	3[H]	–	2 ps	500 MHz	–	–	–	Y	–	± 1V	0.25, 1, 5
#DSO 8500P-02	PCI	$**7495**	Call	FOD# **1585**	8 bits	**256KS** on DSO 8500P-02, 2 MS Model Available	–	–	1	–	–	–	3[H]	–	2 ps	500 MHz	–	–	–	Y	–	± 1V	0.25, 1, 5
#DSO 512	ISA	$**2795**	6B	FOD# **1555**	12 bits	512K Samples	–	–	2	–	–	–	16[H]	–	0.20 µs	5/10 MHz	–	–	–	Y	–	± 1V	0.2, 0.5, 1, 2, 5, 10
#DSO 512-04	ISA	$**2995**	6B	FOD# **1555**	12 bits	**1MS** on DSO 512-04, Models to 16MS Available	–	–	2	–	–	–	16[H]	–	0.20 µs	5/10 MHz	–	–	–	Y	–	± 1V	0.2, 0.5, 1, 2, 5, 10
#DSO 512P	PCI	$**4795**	6B	FOD# **1555**	12 bits	512K Samples	–	–	2	–	–	–	6[H]	–	0.20 µs	5/10 MHz	–	–	–	Y	–	± 1V	0.2, 0.5, 1, 2, 5, 10
#DSO 512P-04	PCI	$**4995**	6B	FOD# **1555**	12 bits	**1MS** on DSO 512P-04, 2 & 4 MS Models Available	–	–	2	–	–	–	6[H]	–	0.20 µs	5/10 MHz	–	–	–	Y	–	± 1V	0.2, 0.5, 1, 2, 5, 10
#DSO 2012	ISA	$**4995**	6B	FOD# **1511**	12 bits	512K Samples	–	–	2	–	–	–	16[H]	–	0.10 µs	20 MHz	–	–	–	Y	–	± 1V	0.2, 0.5, 1, 2, 5, 10
#DSO 2012-04	ISA	$**5495**	6B	FOD# **1511**	12 bits	**1MS** on DSO 2012-04, Models to 16MS Available	–	–	2	–	–	–	16[H]	–	0.10 µs	20 MHz	–	–	–	Y	–	± 1V	0.2, 0.5, 1, 2, 5, 10
#DSO 2012P	PCI	$**6995**	6B	FOD# **1522**	12 bits	512K Samples	–	–	2	–	–	–	6[H]	–	0.10 µs	20 MHz	–	–	–	Y	–	± 1V	0.2, 0.5, 1, 2, 5, 10
#DSO 2012P-02	PCI	$**7495**	6B	FOD# **1522**	12 bits	**1MS** on DSO 2012P-04, 2 & 4 MS Models Available	–	–	2	–	–	–	6[H]	–	0.10 µs	20 MHz	–	–	–	Y	–	± 1V	0.2, 0.5, 1, 2, 5, 10
#DSO 6012	ISA	$**6995**	6B	FOD# **1512**	12 bits	512K Samples	–	–	2	–	–	–	16[H]	–	0.03 µs	60 MHz	–	–	–	Y	–	± 1V	0.2, 0.5, 1, 2, 5, 10
#DSO 6012-04	ISA	$**7495**	6B	FOD# **1512**	12 bits	**1MS** on DSO 6012-04, Models to 16MS Available	–	–	2	–	–	–	16[H]	–	0.03 µs	60 MHz	–	–	–	Y	–	± 1V	0.2, 0.5, 1, 2, 5, 10
#DSO 6012P	PCI	$**8995**	6B	FOD# **1562**	12 bits	512K Samples	–	–	2	–	–	–	6[H]	–	0.03 µs	60 MHz	–	–	–	Y	–	±1V	0.2, 0.5, 1, 2, 5, 10
#DSO 6012P-02	PCI	$**9495**	6B	FOD# **1562**	12 bits	**1MS** on DSO 6012P-04, 2 & 4 MS Models Available	–	–	2	–	–	–	6[H]	–	0.03 µs	60 MHz	–	–	–	Y	–	±1V	0.2, 0.5, 1, 2, 5, 10
#DSO 8012	ISA	$**7495**	6B	FOD# **1580**	12 bits	512K Samples	–	–	2	–	–	–	16[H]	–	0.01 µs	80 MHz	–	–	–	Y	–	± 1V	0.2, 0.5, 1, 2, 5, 10
#DSO 8012-02	ISA	$**7995**	6B	FOD# **1580**	12 bits	**1MS** on DSO 8012-02, 2 & 4 MS Models Available	–	–	2	–	–	–	16[H]	–	0.01 µs	80 MHz	–	–	–	Y	–	± 1V	0.2, 0.5, 1, 2, 5, 10
#DSO 8012A	ISA	$**7995**	6B	FOD# **1580**	12 bits	512K Samples	–	–	2	–	–	–	16[H]	–	0.01 µs	100 MHz	–	–	–	Y	–	± 1V	0.2, 0.5, 1, 2, 5, 10
#DSO 8012A-02	ISA	$**8495**	6B	FOD# **1580**	12 bits	**1MS** on DSO 8012A-02, 2 & 4 MS Models Available	–	–	2	–	–	–	16[H]	–	0.01 µs	100 MHz	–	–	–	Y	–	± 1V	0.2, 0.5, 1, 2, 5, 10
#DSO 8012P	PCI	$**9495**	6B	FOD# **1582**	12 bits	512K Samples	–	–	2	–	–	–	6[H]	–	0.01 µs	80 MHz	–	–	–	Y	–	±1V	0.2, 0.5, 1, 2, 5, 10
#DSO 8012P-02	PCI	$**9995**	6B	FOD# **1582**	12 bits	1M Samples	–	–	2	–	–	–	6[H]	–	0.01 µs	80 MHz	–	–	–	Y	–	±1V	0.2, 0.5, 1, 2, 5, 10
#DSO 8012AP	PCI	$**9995**	6B	FOD# **1582**	12 bits	512K Samples	–	–	2	–	–	–	6[H]	–	0.01 µs	100 MHz	–	–	–	Y	–	±1V	0.2, 0.5, 1, 2, 5, 10
#DSO 8012AP-02	PCI	$**10,495**	6B	FOD# **1582**	12 bits	1M Samples	–	–	2	–	–	–	6[H]	–	0.01 µs	100 MHz	–	–	–	Y	–	±1V	0.2, 0.5, 1, 2, 5, 10
#DSO 1016	ISA	$**8995**	Call	FOD# **1516**	**16 bits**	256K Samples	–	–	1	–	–	–	4[H]	–	0.1 µs	10 MHz	–	–	–	Y	–	±1V	–
#DSO 1016-02	ISA	$**9495**	Call	FOD# **1516**	**16 bits**	**1MS** on DSO 1016-02, Models to 8MS Available	–	–	1	–	–	–	4[H]	–	0.1 µs	10 MHz	–	–	–	Y	–	±1V	–
#DYR 8	ISA	$**695**	52	FOD# **3026**	12-18 bit	–	–	–	–	8	–	–	–	–	0.5-16 ms	1700 Hz	–	Y[P]	Y	Y	–1 to +10V	±5V	1, 20, 200
#DYR 8U	ISA	$**1195**	52	FOD# **3026**	16-20 bit	–	–	–	–	8	–	–	–	–	1-20 ms	900 Hz	–	Y[P]	Y	Y	–1 to +10V	±5V	1, 20, 200
#DYR 16	ISA	$**1195**	52	FOD# **3026**	12-18 bit	–	–	–	–	16	–	–	–	–	0.5-16 ms	1700 Hz	–	Y[P]	Y	Y	–1 to +10V	±5V	1, 20, 200
#DYR 16U	ISA	$**1795**	52	FOD# **3026**	16-20 bit	–	–	–	–	16	–	–	–	–	1-20 ms	900 Hz	–	Y[P]	Y	Y	–1 to +10V	±5V	1, 20, 200
#FAST 1211U/B	ISA	$**2895**	Call	FOD# **3034**	12 bits	1M Samples	S	–	–	4	–	20	16[M]	–	1 µs	1 MHz	–	–	Y	Y	0-2.5, 5, 10V on FAST 1211U	±2.5V, ±5V, ±10V on FAST 1211B	–
#FAST 1212U/B	ISA	$**3195**	Call	FOD# **3034**	12 bits	2M Samples	S	–	–	4	–	20	16[M]	–	1 µs	1 MHz	–	–	Y	Y	0-2.5, 5, 10V on FAST 1212U	±2.5V, ±5V, ±10V on FAST 1212B	–
#FAST 1214U/B	ISA	$**3695**	Call	FOD# **3034**	12 bits	4M Samples	S	–	–	4	–	20	16[M]	–	1 µs	1 MHz	–	–	Y	Y	0-2.5, 5, 10V on FAST 1214U	±2.5V, ±5V, ±10V on FAST 1214B	–
#FAST 1218U/B	ISA	$**4295**	Call	FOD# **3034**	12 bits	8M Samples	S	–	–	4	–	20	16[M]	–	1 µs	1 MHz	–	–	Y	Y	0-2.5, 5, 10V on FAST 1218U	±2.5V, ±5V, ±10V on FAST 1218B	–
#FAST 1411-18U/B	ISA	$**3495+**	Call	FOD# **3034**	14 bits	**1M Samples** on 1411, Models to 8MW Available	S	–	–	4	–	20	16[M]	–	1 µs	1 MHz	–	–	Y	Y	0-2.5, 5, 10V on 1411U-1418U	±2.5V, ±5V, ±10V on 1411B-1418B	–
#FAST 1611-18	ISA	$**3895+**	Call	FOD# **3034**	16 bits	**1M Samples** on 1611, Models to 8MW Available	S	–	–	4	–	20	16[M]	–	1 µs	1 MHz	–	–	Y	Y	0-2.5, 5, 10V	± 2.5, 5, 10V	–
#HSDAS 12A	ISA	$**1895**	56	FOD# **3035**	12 bits	128 Samples	B[N]	–	16	8	256	128	4 Ch	–	2 µs	500 kHz	–	–	Y	–	0-2.5, 5, 10V	± 2.5, 5, 10V	–
#HSDAS 12	ISA	$**1695**	56	FOD# **3035**	12 bits	128 Samples	B[N]	–	16	8	256	128	4 Ch	–	2 µs	400 kHz	–	–	Y	–	0-2.5, 5, 10V	± 2.5, 5, 10V	–
#HSDAS 16	ISA	$**1695**	56	FOD# **3035**	16 bits	128 Samples	B[N]	–	16	8	256	128	–	–	5 µs	200 kHz	–	–	Y	–	0-2.5, 5, 10V	± 2.5, 5, 10V	–
#LSDAS 16	ISA	$**1295**	56	FOD# **3035**	16 bits	128 Samples	B[N]	–	16	8	256	128	–	–	20 µs	50 kHz	–	–	Y	–	0-2.5, 5, 10V	± 2.5, 5, 10V	–
#LSDAS 16AC	ISA	$**895**	56	FOD# **3035**	16 bits	128 Samples	B[N]	–	16	8	256	128	–	–	20 µs	50 kHz	–	–	Y	–	0-2.5, 5, 10V	± 2.5, 5, 10V	–

Bus: **ISA** = ISA 16-bit (AT) Slot; **ISA-8** = Use in any ISA Slot: 8-bit (XT) or 16-bit (AT); **PCI** = PCI Expansion Slot; **PCM** = PCMCIA Type II Slot; **PC/104** = PC/104 Expansion Connector; **Ser** = Serial (RS-232) Port; **Par** = Parallel (Printer) Port.

H: Our DSO boards can sample all channels simultaneously, including all boards in a system ordered as Master + Slave(s).
M: Our **FAST** series boards offer Simultaneous Sample and Hold using our **SSH 8** accessory board. Call for details.
N: 16-bit block-mode DMA transfers.

	Y	Y	Y	Y	–	–	–	–	–	–	–	–	–	–	–	–	GageScope Softw.	–	–	–	–	Y	Y	–	–	Y	Y	**#DSO 225**
	Y	Y	Y	Y	–	–	–	–	–	–	–	–	–	–	–	–	GageScope Softw.	–	–	–	–	Y	Y	–	–	Y	Y	**#DSO 225-02**
	Y	Y	Y	Y	–	–	–	–	–	–	–	–	–	–	–	–	GageScope Softw.	–	–	–	–	Y	Y	–	–	Y	Y	**#DSO 265**
	Y	Y	Y	Y	–	–	–	–	–	–	–	–	–	–	–	–	GageScope Softw.	–	–	–	–	Y	Y	–	–	Y	Y	**#DSO 265-03**
	Y	Y	Y	Y	–	–	–	–	–	–	–	–	–	–	–	–	GageScope Softw.	–	–	–	–	Y	Y	–	–	Y	Y	**#DSO 2125**
	Y	Y	Y	Y	–	–	–	–	–	–	–	–	–	–	–	–	GageScope Softw.	–	–	–	–	Y	Y	–	–	Y	Y	**#DSO 2125-03**
	Y	Y	Y	Y	–	–	–	–	–	–	–	–	–	–	–	–	GageScope Softw.	–	–	–	–	Y	Y	–	–	Y	Y	**#DSO 8500P**
	Y	Y	Y	Y	–	–	–	–	–	–	–	–	–	–	–	–	GageScope Softw.	–	–	–	–	Y	Y	–	–	Y	Y	**#DSO 8500P-02**
	Y	Y	Y	Y	–	–	–	–	–	–	–	–	–	–	–	–	GageScope Softw.	–	–	–	–	Y	Y	–	–	Y	Y	**#DSO 512**
	Y	Y	Y	Y	–	–	–	–	–	–	–	–	–	–	–	–	GageScope Softw.	–	–	–	–	Y	Y	–	–	Y	Y	**#DSO 512-04**
	Y	Y	Y	Y	–	–	–	–	–	–	–	–	–	–	–	–	GageScope Softw.	–	–	–	–	Y	Y	–	–	Y	Y	**#DSO 512P**
	Y	Y	Y	Y	–	–	–	–	–	–	–	–	–	–	–	–	GageScope Softw.	–	–	–	–	Y	Y	–	–	Y	Y	**#DSO 512P-02**
	Y	Y	Y	Y	–	–	–	–	–	–	–	–	–	–	–	–	GageScope Softw.	–	–	–	–	Y	Y	–	–	Y	Y	**#DSO 2012**
	Y	Y	Y	Y	–	–	–	–	–	–	–	–	–	–	–	–	GageScope Softw.	–	–	–	–	Y	Y	–	–	Y	Y	**#DSO 2012-04**
	Y	Y	Y	Y	–	–	–	–	–	–	–	–	–	–	–	–	GageScope Softw.	–	–	–	–	Y	Y	–	–	Y	Y	**#DSO 2012P**
	Y	Y	Y	Y	–	–	–	–	–	–	–	–	–	–	–	–	GageScope Softw.	–	–	–	–	Y	Y	–	–	Y	Y	**#DSO 2012P-02**
	Y	Y	Y	Y	–	–	–	–	–	–	–	–	–	–	–	–	GageScope Softw.	–	–	–	–	Y	Y	–	–	Y	Y	**#DSO 6012**
	Y	Y	Y	Y	–	–	–	–	–	–	–	–	–	–	–	–	GageScope Softw.	–	–	–	–	Y	Y	–	–	Y	Y	**#DSO 6012-04**
	Y	Y	Y	Y	–	–	–	–	–	–	–	–	–	–	–	–	GageScope Softw.	–	–	–	–	Y	Y	–	–	Y	Y	**#DSO 6012P**
	Y	Y	Y	Y	–	–	–	–	–	–	–	–	–	–	–	–	GageScope Softw.	–	–	–	–	Y	Y	–	–	Y	Y	**#DSO 6012P-02**
	Y	Y	Y	Y	–	–	–	–	–	–	–	–	–	–	–	–	GageScope Softw.	–	–	–	–	Y	Y	–	–	Y	Y	**#DSO 8012**
	Y	Y	Y	Y	–	–	–	–	–	–	–	–	–	–	–	–	GageScope Softw.	–	–	–	–	Y	Y	–	–	Y	Y	**#DSO 8012-02**
	Y	Y	Y	Y	–	–	–	–	–	–	–	–	–	–	–	–	GageScope Softw.	–	–	–	–	Y	Y	–	–	Y	Y	**#DSO 8012A**
	Y	Y	Y	Y	–	–	–	–	–	–	–	–	–	–	–	–	GageScope Softw.	–	–	–	–	Y	Y	–	–	Y	Y	**#DSO 8012A-02**
	Y	Y	Y	Y	–	–	–	–	–	–	–	–	–	–	–	–	GageScope Softw.	–	–	–	–	Y	Y	–	–	Y	Y	**#DSO 8012P**
	Y	Y	Y	Y	–	–	–	–	–	–	–	–	–	–	–	–	GageScope Softw.	–	–	–	–	Y	Y	–	–	Y	Y	**#DSO 8012P-02**
	Y	Y	Y	Y	–	–	–	–	–	–	–	–	–	–	–	–	GageScope Softw.	–	–	–	–	Y	Y	–	–	Y	Y	**#DSO 8012AP**
	Y	Y	Y	Y	–	–	–	–	–	–	–	–	–	–	–	–	GageScope Softw.	–	–	–	–	Y	Y	–	–	Y	Y	**#DSO 8012AP-02**
	Y	Y	Y	Y	–	–	–	–	–	–	–	–	–	–	–	–	GageScope Softw.	–	–	–	–	Y	Y	–	–	Y	Y	**#DSO 1016**
	Y	Y	Y	Y	–	–	–	–	–	–	–	–	–	–	–	–	GageScope Softw.	–	–	–	–	Y	Y	–	–	Y	Y	**#DSO 1016-02**
	–	–	Y	Y	Y	>100dB	–	–	–	–	–	–	1	8 Indiv.	Software	50mA	Quicklog PC	–	–	–	–	–	Call	Y	–	–	Y	**#DYR 8**
	–	–	Y	Y	Y	>100dB	–	–	–	–	–	–	1	8 Indiv.	Software	50mA	Quicklog PC	–	–	–	–	–	Call	Y	–	–	Y	**#DYR 8U**
	–	–	Y	Y	Y	>100dB	–	–	–	–	–	–	1	16 Indiv.	Software	50mA	Quicklog PC	–	–	–	–	–	Call	Y	–	–	Y	**#DYR 16**
	–	–	Y	Y	Y	>100dB	–	–	–	–	–	–	1	16 Indiv.	Software	50mA	Quicklog PC	–	–	–	–	–	Call	Y	–	–	Y	**#DYR 16U**
	Y	Y	Y	Y	Y	80dB	–	–	–	–	–	–	–	–	–	–	Utility Software	–	–	–	–	–	Y	–	Y	–	–	**#FAST 1211U/B**
	Y	Y	Y	Y	Y	80dB	–	–	–	–	–	–	–	–	–	–	Utility Software	–	–	–	–	–	Y	–	Y	–	–	**#FAST 1212U/B**
	Y	Y	Y	Y	Y	80dB	–	–	–	–	–	–	–	–	–	–	Utility Software	–	–	–	–	–	Y	–	Y	–	–	**#FAST 1214U/B**
	Y	Y	Y	Y	Y	80dB	–	–	–	–	–	–	–	–	–	–	Utility Software	–	–	–	–	–	Y	–	Y	–	–	**#FAST 1218U/B**
	Y	Y	Y	Y	Y	80dB	–	–	–	–	–	–	–	–	–	–	Utility Software	–	–	–	–	–	Y	–	Y	–	–	**#FAST 1411-18U/B**
	Y	Y	Y	Y	Y	80dB	–	–	–	–	–	–	–	–	–	–	Utility Software	–	–	–	–	–	Y	–	Y	–	–	**#FAST 1611-18**
	Y	Y	Y	Y	Y	80dB	–	2	0-5, 10V	±5, 10V	Jumper	200kHz	1	2x8-bit	Software	24mA	Utility Software	Y	Y	–	–	Y	Y	–	–	–	Y	**#HSDAS 12A**
	Y	Y	Y	Y	Y	80dB	–	2	0-5, 10V	±5, 10V	Jumper	200kHz	1	2x8-bit	Software	24mA	Utility Software	Y	Y	–	–	Y	Y	–	–	–	Y	**#HSDAS 12**
	Y	Y	Y	Y	Y	80dB	–	2	0-5, 10V	±5, 10V	Jumper	200kHz	1	2x8-bit	Software	24mA	Utility Software	Y	Y	–	–	Y	Y	–	–	–	Y	**#HSDAS 16**
	Y	Y	Y	Y	Y	80dB	–	2	0-5, 10V	±5, 10V	Jumper	200kHz	1	2x8-bit	Software	24mA	Utility Software	Y	Y	–	–	Y	Y	–	–	–	Y	**#LSDAS 16**
	Y	Y	Y	Y	Y	80dB	–	–	–	–	–	–	1	2x8-bit	Software	24mA	Utility Software	Y	Y	–	–	Y	Y	–	–	–	Y	**#LSDAS 16AC**

P: **DYR** boards offer Dynamic Resoution, focusing the full resolution against the signal for greatest resolution on each sample.

Call: Please call for more information. Availability of hardware drivers listed as "Call" was tentative at press time.

Tel: 203-483-8815 Fax: 203-483-9024
Fax-on-Demand System: 203-483-9966

Analog Input Boards

Continued from Page 45

Part #	Bus	Price	Page Number for More Information	Fax-on-Demand Info # (203-483-9966)	Resolution	On-Board Memory Buffer (1 Word = 1 Sample)	DMA Modes Available (Single/Dual)	On-Board Microprocessor	Single-Ended	Differential	Single-Ended with Multiplexer	Differential with Multiplexer	Simultaneous Sampling	Cold Junction Comp. Channel	A/D Converter Speed	Maximum Sample Rate	Current Inputs	Autoranging	Software-Selectable Ranges	Individual Gain/Channel	Unipolar Inputs	Bi-Polar Inputs	Gains
			General Specifications						**Number of Channels**						**Speed**				**Input Ranges**				
#INET 100 with INET 200	PCI	$1480	8	FOD# 4203	14 bits	128K Samples	–	Y	16	8	–	512	–	–	4 µs	166 kHz	Y	–	Y	Y	Strain Gauges, Ω, RTDs, TCs	±10mV, 80mV, 0.6V, & ±5V Ranges	–
#LLAD 201	Ser	$595	Call	FOD# 3055	24 bits	1 Sample	–	–	–	6	–	96	–	–	ΔΣ Conv.	300 Hz	–	–	Y	–	0-5V	± 5V	1, 2, 4, 8, 16, 32, 64, 128
#LLAD 250	Par	$1295	Call	FOD# 3055	22 bits	–	–	–	–	6	–	96	–	–	185 µs	80 Hz	–	–	Y	–	0-5V	± 5V (±10V)[R]	–
#M232 214	Ser	$169	Call	FOD# 4214	14 bits	–	–	–	2	–	–	–	–	–	20 µs	4 Hz	–	–	–	–	0-5V	–	1
#M232 408	Ser	$129	Call	FOD# 4214	8 bits	–	–	–	4	–	–	–	–	–	20 µs	4 Hz	–	–	–	–	0-5V	–	1
#PC 30F	ISA	$595	56	FOD# 3038	12 bits	16-Sample FIFO	D	–	16	8	–	–	–	–	3.3 µs	330 kHz	–	–	Y	Y	–	± 5, 10V	1, 10, 100, 1000
#PC 30FA	ISA	$795	56	FOD# 3038	12 bits	16-Sample FIFO	D	–	16	8	–	–	–	–	3.3 µs	330 kHz	–	–	Y	Y	–	± 5, 10V	1, 10, 100, 1000
#PC 30FS4	ISA	$795	56	FOD# 3038	12 bits	16-Sample FIFO	D	–	16	–	–	–	4	–	3.3 µs	330 kHz	–	–	–	–	–	±5V	–
#PC 30FAS4	ISA	$1095	56	FOD# 3038	12 bits	16-Sample FIFO	D	–	16	–	–	–	4	–	3.3 µs	330 kHz	–	–	–	–	–	±5V	–
#PC 30FS16	ISA	$995	56	FOD# 3038	12 bits	16-Sample FIFO	D	–	16	–	–	–	16	–	3.3 µs	330 kHz	–	–	–	–	–	±5V	–
#PC 30FAS16	ISA	$1395	56	FOD# 3038	12 bits	16-Sample FIFO	D	–	16	–	–	–	16	–	3.3 µs	330 kHz	–	–	–	–	–	±5V	–
#PC 30G	ISA	$495	56	FOD# 3038	12 bits	16-Sample FIFO	D	–	16	8	–	–	–	–	10 µs	100 kHz	–	–	Y	Y	0-10V	± 5, 10V	1, 10, 100, 1000
#PC 30GA	ISA	$695	56	FOD# 3038	12 bits	16-Sample FIFO	D	–	16	8	–	–	–	–	10 µs	100 kHz	–	–	Y	Y	0-10V	± 5, 10V	1, 10, 100, 1000
#PC 30GS4	ISA	$695	56	FOD# 3038	12 bits	16-Sample FIFO	D	–	16	–	–	–	4	–	10 µs	100 kHz	–	–	–	–	–	±5V	–
#PC 30GAS4	ISA	$995	56	FOD# 3038	12 bits	16-Sample FIFO	D	–	16	–	–	–	4	–	10 µs	100 kHz	–	–	–	–	–	±5V	–
#PC 30GS16	ISA	$895	56	FOD# 3038	12 bits	16-Sample FIFO	D	–	16	–	–	–	16	–	10 µs	100 kHz	–	–	–	–	–	±5V	–
#PC 30GAS16	ISA	$1195	56	FOD# 3038	12 bits	16-Sample FIFO	D	–	16	–	–	–	16	–	10 µs	100 kHz	–	–	–	–	–	±5V	–
#PCL 71A & B	PCM	$595	Call	FOD# 3038	12 bits	–	–	–	–	8	–	–	–	Y	33 µs	30 kHz	–	–	Y	–	0-10V	± 5, 10V	**PCL 71A**: 1, 2, 4, & 8 **PCL 71B**: 1, 10, 100, 1000
#PCL 812G	ISA-8	$395	50	FOD# 3039	12 bits	–	S	–	16	–	–	160	–	–	25 µs	30 kHz	–	–	–	–	–	± 5, 10V	1, 2, 4, 8, 16
#PCL 818H	ISA-8	$595	50	FOD# 3040	12 bits	–	S	–	16	8	–	160	–	–	8 µs	100 kHz	–	–	Y	Y	0-10V	± 5, 10V	1, 2, 4, 8
#PCL 818HD	ISA-8	$595	50	FOD# 3040	12 bits	1024 Samples	S	–	16	8	–	160	–	–	8 µs	100 kHz	–	–	Y	Y	0-10V	± 5, 10V	1, 2, 4, 8
#PCL 818HG	ISA-8	$695	50	FOD# 3040	12 bits	1024 Samples	S	–	16	8	–	160	–	–	8 µs	100 kHz	–	–	Y	Y	0-10V	± 5, 10V	1, 10, 100, 1000
#PCL 818LC	ISA-8	$295	50	FOD# 3040	12 bits	–	S	–	16	8	–	160	–	–	25 µs	40 kHz	–	–	Y	Y	–	± 5V	1, 2, 4, 8
#PC104 1010	PC/104	$545	Call	FOD# 3210	12 bits	–	S	–	16	8	–	–	–	–	10 µs	90 kHz	–	–	Y	–	0-10V	± 10V	1, 2, 4, 8
#PC104 2012B/U	PC/104	$425	Call	FOD# 3212	12 bits	256 Samples	S	–	16	8	–	–	–	–	10 µs	100 kHz	–	–	Y	–	**2012U**: 0-10V	**2012B**: ±10V	1, 10, 100
#PC104 2016B/U	PC/104	$625	Call	FOD# 3212	16 bits	256 Samples	S	–	16	8	–	–	–	–	10 µs	100 kHz	–	–	Y	–	**2016U**: 0-10V	**2016B**: ±10V	1, 10, 100
#4CYDAS 1612J	PC/104	$399	Call	FOD# 3206	12 bits	512 Samples	S	–	16	8	–	256	16[A]	–	3 µs	160 kHz	–	–	–	–	0-5, 10V	± 5, 10V	1, 2, 4, 8
#4CYDAS 1616J	PC/104	$499	Call	FOD# 3206	16 bits	512 Samples	S	–	16	8	–	256	16[A]	–	10 µs	100 kHz	–	–	–	–	0-5, 10V	±5V	1, 2, 4, 8
#4CYDAS 8	PC/104	$199	Call	FOD# 3208	12 bits	–	–	–	8	–	–	128	–	–	25 µs	20 kHz	–	–	–	–	0-10V	± 5, 10V	–
#PPD 1612 Avail. Soon	PCI	$1650	48	FOD# 3050	12 bits	1K-Sample FIFO	D	Y	16	8	–	–	–	–	1 µs	1 MHz	–	–	Y	Y	0-5, 10V	± 5, 10V	–
#PPD 1616 Avail. Soon	PCI	$1650	48	FOD# 3050	16 bits	1K-Sample FIFO	D	Y	16	8	–	–	–	–	6 µs	150 kHz	–	–	Y	Y	0-5, 10V	± 5, 10V	1, 2, 4, 8
#PPD 6412 Avail. Soon	PCI	$2495	48	FOD# 3050	12 bits	1K-Sample FIFO	D	Y	64	32	–	–	–	–	1 µs	1 MHz	–	–	Y	Y	0-5, 10V	± 5, 10V	–
#PPD 6416 Avail. Soon	PCI	$2395	48	FOD# 3050	16 bits	1K-Sample FIFO	D	Y	64	32	–	–	–	–	6 µs	150 kHz	–	–	Y	Y	0-5, 10V	± 5, 10V	1, 2, 4, 8
#PPIO AI08	Par	$199	Call	FOD# 4128	12 bits	–	–	–	8	–	–	128	–	–	25 µs	30-3000 Hz	–	–	–	–	0-10V	± 5, 10V	–
#UPC 601	ISA-8	$1795	53	FOD# 3041	14 bits	14K Samples	–	–	16	8	–	–	–	–	40 µs	20 kHz	–	–	Y	Y	UPC Boards include 10Ω – 12KΩ A/D range, & excitation for transducers.	± 10.24V	1, 2, 4, 8, 16, 32, 64, 128, 256, 512, & 1024
#UPC 608	ISA-8	$2395	53	FOD# 3041	14 bits	14K Samples	–	–	16	8	–	–	–	–	40 µs	20 kHz	–	–	Y	Y		± 10.24V	1, 2, 4, 8, 16, 32, 64, 128, 256, 512, & 1024
#WIN 10/30D	ISA	10: $695 30: $1250	55	FOD# 3042	12 bits	1K-Sample FIFO	D	Y	16	–	4096	2K	–	–	1 µs	10: 400 kHz 30: 1 MHz	–	–	Y	Y	0-5V	± 5V	–
#WIN 10/30DA	ISA	10: $895 30: $1495	55	FOD# 3042	12 bits	1K-Sample FIFO	D	Y	16	–	4096	2K	–	–	1 µs	10: 400 kHz 30: 1 MHz	–	–	Y	Y	0-5V	± 5V	–
#WIN 10/30GH/GL	ISA	10: $1195 30: $1625	55	FOD# 3042	12 bits	1K-Sample FIFO	D	Y	–	8	4096	2K	–	–	1 µs	10: 400 kHz 30: 1 MHz	–	–	Y	Y	0-5V	± 5V	**WIN xxGL**: 1, 10, 100, 1000 **WIN xxGH**: 1, 2, 4, 8
#WIN 10/30S4	ISA	10: $995 30: $1625	55	FOD# 3042	12 bits	1K-Sample FIFO	D	Y	4	–	4096	2K	4	–	1 µs	10: 400 kHz 30: 1 MHz[T]	–	–	Y	Y	0-5V	± 5V	–
#WIN 10/30S	ISA	10: $1295 30: $1875	55	FOD# 3042	12 bits	1K-Sample FIFO	D	Y	16	–	4096	2K	16	–	1 µs	10: 400 kHz 30: 1 MHz[T]	–	–	Y	Y	0-5V	± 5V	–
#WIN 10/30GSH/GSL	ISA	10: $1395 30: $2250	55	FOD# 3042	12 bits	1K-Sample FIFO	D	Y	8	8	4096	2K	16	–	1 µs	10: 400 kHz 30: 1 MHz[T]	–	–	Y	Y	0-5V	± 5V	**WIN xxGSL**: 1, 10, 100, 1000 **WIN xxGSH**: 1, 2, 4, 8
#WIN 10/30D16	ISA	10: $695 30: $1250	55	FOD# 3044	16 bits	1K-Sample FIFO	D	Y	16	–	4096	2K	–	–	6 µs	10: 100 kHz 30: 200 kHz	–	–	Y	Y	0-5V	± 5V	–
#WIN 10/30DA16	ISA	10: $895 30: $1495	55	FOD# 3044	16 bits	1K-Sample FIFO	D	Y	16	–	4096	2K	–	–	6 µs	10: 100 kHz 30: 200 kHz	–	–	Y	Y	0-5V	± 5V	–
#WIN 10/30S416	ISA	10: $995 30: $1875	55	FOD# 3044	16 bits	1K-Sample FIFO	D	Y	4	–	4096	2K	4	–	6 µs	10: 100 kHz 30: 200 kHz	–	–	Y	Y	0-5V	± 5V	–
#WIN 10/30S16	ISA	10: $1295 30: $2125	55	FOD# 3044	16 bits	1K-Sample FIFO	D	Y	16	–	4096	2K	16	–	6 µs	10: 100 kHz 30: 200 kHz	–	–	Y	Y	0-5V	± 5V	–

Bus: ISA = ISA 16-bit (AT) Slot; **ISA-8** = Use in any ISA Slot: 8-bit (XT) or 16-bit (AT); **PCI** = PCI Expansion Slot; **PCM** = PCMCIA Type II Slot; **PC/104** = PC/104 Expansion Connector; **Ser** = Serial (RS-232) Port; **Par** = Parallel (Printer) Port.

R: ±10V Input Range for the LLAD 250 may be ordered as an option.

S: Our **PC 30** series boards include 4 analog output (D/A) channels – two with 12-bit resolution, & 2 w/8-bit resolution.

T: **WIN 30S, S4, GSH, & GSL** boards offer throughput rates up to 750kHz on one channel, or 1MHz across 4 or more channels

DATA ACQUISITION COMPARISON CHART

Part #	Trigger Modes: Pretrigger	Trigger Modes: Analog Slope	Trigger Modes: External Pulse	Trigger Modes: Software	Trigger Modes: Counter/Timer	Noise Rejection: Common Mode Rejection Ratio	Noise Rejection: Normal Mode Rejection Ratio	Analog Outputs: Number of D/A Channels	Analog Outputs: Unipolar D/A Ranges	Analog Outputs: Bi-Polar D/A Ranges	Analog Outputs: D/A Range Select	Analog Outputs: D/A Conversion Speed	Digital I/O: Counter/Timer Channels	Digital I/O: Number of Digital I/O Lines	Digital I/O: Input/Output Select	Digital I/O: Output Current Sink	Included Free with Board	Software Compatibility: Labtech Notebook/Control	Software Compatibility: SnapMaster	Software Compatibility: Universal Driver Library	Software Compatibility: HP VEE	Software Compatibility: Windows NT	Software Compatibility: DASYLab	Software Compatibility: WorkBench	Software Compatibility: TestPoint	Software Compatibility: LabWindows	Software Compatibility: LabVIEW
#INET 100	–	Y	Y	Y	Y	80dB	–	8	–	±5V	Fixed	100kHz	10	8 indiv.	Software	100mA	instruNet World	–	–	–	Y	Y	Y	–	Y	–	Y
#LLAD 201	–	–	–	Y	–	96dB	–	–	–	–	–	–	–	8 in/12 out	Fixed	1mA	Ana Log S/W	–	–	–	–	–	–	–	–	–	–
#LLAD 250	–	–	–	Y	–	96dB	–	–	–	–	–	–	–	8 in/12 out	Fixed	1mA	Ana Log S/W	–	–	–	–	–	–	–	–	–	–
#M232 214	–	–	–	–	–	–	–	–	–	–	–	–	–	6 Indiv.	Software	20mA	Utility Software	Ser	–	–	–	–	–	–	–	–	–
#M232 408	–	–	–	–	–	–	–	–	–	–	–	–	–	6 Indiv.	Software	20mA	Utility Software	Ser	–	–	–	–	–	–	–	–	–
#PC 30F	–	–	Y	Y	Y	–	–	–	–	–	–	–	1	3x8-bit	Software	2.5mA	Waveview S/W	–	–	–	–	Y	Y	–	Y	Y	Y
#PC 30FA	–	–	Y	Y	Y	–	–	4[S]	0-10, 13V	±5, 10V	Software	130kHz	1	3x8-bit	Software	2.5mA	Waveview S/W	–	–	–	–	Y	Y	–	Y	Y	Y
#PC 30FS4	–	–	Y	Y	Y	–	–	–	–	–	–	–	1	3x8-bit	Software	2.5mA	Waveview S/W	–	–	–	–	Y	Y	–	Y	Y	Y
#PC 30FAS4	–	–	Y	Y	Y	–	–	4[S]	0-10, 13V	±5, 10V	Software	130kHz	1	3x8-bit	Software	2.5mA	Waveview S/W	–	–	–	–	Y	Y	–	Y	Y	Y
#PC 30FS16	–	–	Y	Y	Y	–	–	–	–	–	–	–	1	3x8-bit	Software	2.5mA	Waveview S/W	–	–	–	–	Y	Y	–	Y	Y	Y
#PC 30FAS16	–	–	Y	Y	Y	–	–	4[S]	0-10, 13V	±5, 10V	Software	130kHz	1	3x8-bit	Software	2.5mA	Waveview S/W	–	–	–	–	Y	Y	–	Y	Y	Y
#PC 30G	–	–	Y	Y	Y	–	–	–	–	–	–	–	1	3x8-bit	Software	2.5mA	Waveview S/W	–	–	–	–	Y	Y	–	Y	Y	Y
#PC 30GA	–	–	Y	Y	Y	–	–	4[S]	0-10, 13V	±5, 10V	Software	130kHz	1	3x8-bit	Software	2.5mA	Waveview S/W	–	–	–	–	Y	Y	–	Y	Y	Y
#PC 30GS4	–	–	Y	Y	Y	–	–	–	–	–	–	–	1	3x8-bit	Software	2.5mA	Waveview S/W	–	–	–	–	Y	Y	–	Y	Y	Y
#PC 30GAS4	–	–	Y	Y	Y	–	–	4[S]	0-10, 13V	±5, 10V	Software	130kHz	1	3x8-bit	Software	2.5mA	Waveview S/W	–	–	–	–	Y	Y	–	Y	Y	Y
#PC 30GS16	–	–	Y	Y	Y	–	–	–	–	–	–	–	1	3x8-bit	Software	2.5mA	Waveview S/W	–	–	–	–	Y	Y	–	Y	Y	Y
#PC 30GAS16	–	–	Y	Y	Y	–	–	4[S]	0-10, 13V	±5, 10V	Software	130kHz	1	3x8-bit	Software	2.5mA	Waveview S/W	–	–	–	–	Y	Y	–	Y	Y	Y
#PCL 71A & B	–	–	–	Y	–	–	–	–	–	–	–	–	–	4 in/4 out	Fixed	8mA	DOS Driver	Y	–	–	–	–	–	–	–	–	–
#PCL 812G	–	–	Y	Y	Y	–	–	2	0-5, 10V	±10V	Ref. Volt.	25kHz	1	16 in/16 out	Fixed	8mA	DOS Driver	Y	–	–	–	Y	Y	–	–	–	–
#PCL 818H	–	–	Y	Y	Y	–	–	1	0-5, 10V	–	Jumper	200kHz	1	16 in/16 out	Fixed	8mA	BASIC Drivers	Y	Y	–	–	Y	Y	–	–	–	–
#PCL 818HD	–	–	Y	Y	Y	–	–	1	0-5, 10V	–	Jumper	200kHz	1	16 in/16 out	Fixed	8mA	BASIC Drivers	Y	Y	–	–	Y	Y	–	–	–	–
#PCL 818HG	–	–	Y	Y	Y	–	–	1	0-5, 10V	–	Jumper	200kHz	1	16 in/16 out	Fixed	8mA	BASIC Drivers	Y	Y	–	–	Y	Y	–	–	–	–
#PCL 818LC	–	–	Y	Y	Y	–	–	1	0-5, 10V	–	Jumper	200kHz	1	16 in/16 out	Fixed	8mA	BASIC Drivers	Y	Y	–	–	Y	Y	–	–	–	–
#PC104 1010	–	–	Y	Y	Y	90dB	–	2	0-10V	±5V	Jumper	33kHz	1	8 in/8 out	Fixed	1.7mA	Win./DOS Drivers	Y	Y	–	–	–	–	–	–	–	–
#PC104 2012B/U	–	Y	Y	Y	Y	70-100dB	–	–	–	–	–	–	1	2x8-bit	Software	10mA	C Drivers	–	–	–	–	–	–	–	–	–	–
#PC104 2016B/U	–	Y	Y	Y	Y	70-100dB	–	–	–	–	–	–	1	2x8-bit	Software	10mA	C Drivers	–	–	–	–	–	–	–	–	–	–
#4CYDAS 1612J	–	–	Y	Y	Y	–	–	–	–	–	–	–	3	4 in/4 out	Fixed	4mA	Diagnostic S/W	Y	Y	Y	Y	–	Y	–	–	–	Y
#4CYDAS 1616J	–	–	Y	Y	Y	–	–	–	–	–	–	–	3	4 in/4 out	Fixed	4mA	Diagnostic S/W	Y	Y	Y	Y	–	Y	–	–	–	Y
#4CYDAS 8	–	–	Y	Y	Y	–	–	–	–	–	–	–	3	3 in/4 out	Fixed	4mA	Diagnostic S/W	Y	Y	Y	Y	Y	Y	–	–	–	Y
#PPD 1612	Y	Y	Y	Y	Y	–	–	2	–	±10V	–	100kHz	3	8 in/8 out	Fixed	24mA	Drivers w/source	–	–	–	Y	Y	–	–	Y	Y	Y
#PPD 1616	Y	Y	Y	Y	Y	–	–	2	–	±10V	–	100kHz	3	8 in/8 out	Fixed	24mA	Drivers w/source	–	–	–	Y	Y	–	–	Y	Y	Y
#PPD 6412	Y	Y	Y	Y	Y	–	–	2	–	±10V	–	100kHz	3	8 in/8 out	Fixed	24mA	Drivers w/source	–	–	–	Y	Y	–	–	Y	Y	Y
#PPD 6416	Y	Y	Y	Y	Y	–	–	2	–	±10V	–	100kHz	3	8 in/8 out	Fixed	24mA	Drivers w/source	–	–	–	Y	Y	–	–	Y	Y	Y
#PPIO AI08	–	–	Y	Y	Y	–	–	–	–	–	–	–	–	3 in/4 out	Fixed	8mA	Diagnostic S/W	Y	–	–	–	–	–	–	–	–	Y
#UPC 601	–	–	Y	Y	Y	70dB	–	–	–	–	–	–	1[U]	–	–	–	Easy Sense S/W	Y	Y	–	–	–	–	–	–	–	–
#UPC 608	–	–	Y	Y	Y	70dB	–	2	4-20mA	±10V	Software	140kHz	1[U]	16 Indiv.	Software	10mA	Easy Sense S/W	Y	Y	–	–	–	–	–	–	–	–
#WIN 10/30D	–	–	Y	Y	–	–	–	–	–	–	–	–	–	3x8-bit	Software	2.5mA	Advanced Utils	Y	Y	–	Y	Y	Y	–	Y	CVI	Y
#WIN 10/30DA	–	–	Y	Y	–	–	–	4[V]	–	±5V	–	100kHz	–	3x8-bit	Software	2.5mA	Advanced Utils	Y	Y	–	Y	Y	Y	–	Y	CVI	Y
#WIN 10/30GH/GL	–	–	Y	Y	–	–	–	4[V]	–	±5V	–	100kHz	–	3x8-bit	Software	2.5mA	Advanced Utils	Y	Y	–	Y	Y	Y	–	Y	CVI	Y
#WIN 10/30S4	–	–	Y	Y	–	–	–	4[V]	–	±5V	–	100kHz	–	3x8-bit	Software	2.5mA	Advanced Utils	Y	Y	–	Y	Y	Y	–	Y	CVI	Y
#WIN 10/30S	–	–	Y	Y	–	–	–	4[V]	–	±5V	–	100kHz	–	3x8-bit	Software	2.5mA	Advanced Utils	Y	Y	–	Y	Y	Y	–	Y	CVI	Y
#WIN 10/30GSH/GSL	–	–	Y	Y	–	–	–	4[V]	–	±5V	–	100kHz	–	3x8-bit	Software	2.5mA	Advanced Utils	Y	Y	–	Y	Y	Y	–	Y	CVI	Y
#WIN 10/30D16	–	–	Y	Y	–	–	–	4[V]	–	±5V	–	100kHz	3	3x8-bit	Software	2.5mA	Advanced Utils	Y	Y	–	Y	Y	Y	–	Y	CVI	Y
#WIN 10/30DA16	–	–	Y	Y	–	–	–	4[V]	–	±5V	–	100kHz	3	3x8-bit	Software	2.5mA	Advanced Utils	Y	Y	–	Y	Y	Y	–	Y	CVI	Y
#WIN 10/30S416	–	–	Y	Y	–	–	–	4[V]	–	±5V	–	100kHz	3	3x8-bit	Software	2.5mA	Advanced Utils	Y	Y	–	Y	Y	Y	–	Y	CVI	Y
#WIN 10/30S16	–	–	Y	Y	–	80dB	–	4[V]	–	±5V	–	100kHz	3	3x8-bit	Software	2.5mA	Advanced Utils	Y	Y	–	Y	Y	Y	–	Y	CVI	Y

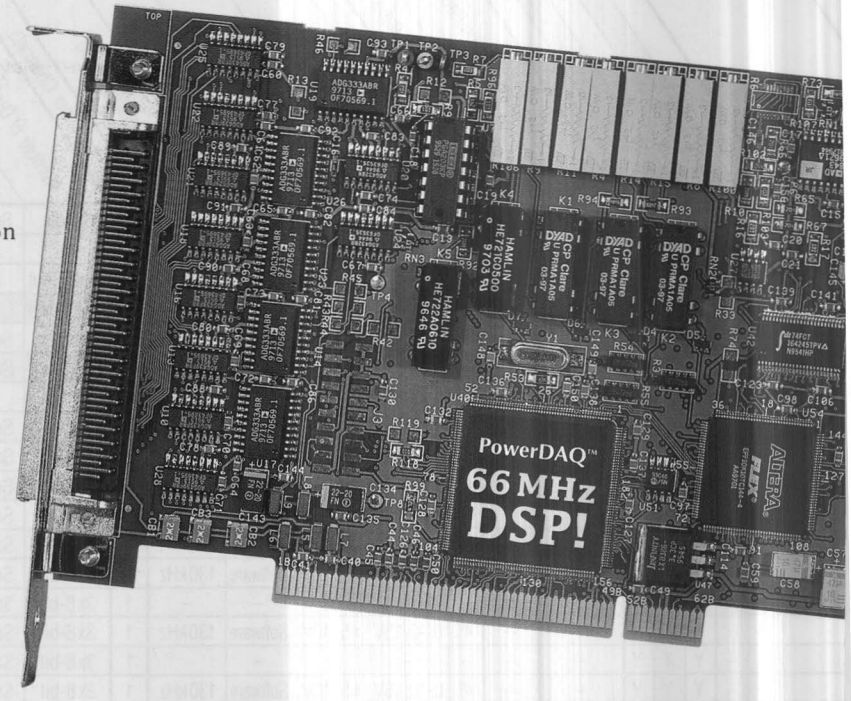
U: Our **UPC** series boards include two 0.02Hz - 50kHz TTL or AC frequency input channels with 16-bit resolution.
V: There are 4 D/A channels on our **WIN 30** series boards – 2 analog outputs w/**16-bit** resolution plus two 12-bit D/As. Our **WIN 10** series boards have two **16-bit** D/A channels on all models.
Call: Please call for more information. Availability of hardware drivers listed as "Call" was tentative at press time.

Tel: 203-483-8815 Fax: 203-483-9024
Fax-on-Demand System: 203-483-9966

PowerDAQ™ Utilizes PCI Interface to Obtain Best

Features:

- Onboard 66 MHz Motorola 56301 DSP processor with integrated PCI controller – PCI Release 2.1 compliant
- Fullest PCI implementation with no legacy code and no "matchmaker" circuitry
- Runs in Slave Mode or PCI Bus-Mastering Mode
- Scatter/Gather DMA
- Simultaneous A/D, D/A, DIO, and Counter/Timer operation
- 16 single-ended A/D channels (#PPD 1612 & 1616)
  64 single-ended A/D channels (#PPD 6412 & 6416)
- 1 MHz sampling rate
- 12-bit resolution
- Extensive triggering controls for A/D and D/A
- Software calibration
- Two 12-bit Analog Outputs
- 8 high-speed digital inputs (can generate interrupts)
  8 high-speed digital outputs
- Three 16-bit user-accessible counter/timers
- Supplied with Windows 95/Windows NT drivers and DLL
- Modular Subsystem design
- Full SMT (surface-mount) design for highest reliability
- Third party software support:
  LabVIEW™ for Windows 95 and Windows NT
  LabWindows/CVI™ for Windows 95 and Windows NT
  HP VEE for Windows 95 and Windows NT



The Promise of PCI – and the Reality

The PCI bus has promised to remove all of the bottlenecks which the ISA bus placed in the way of high-performance data acquisition users. The reality is that none of the PCI data acquisition cards currently on the market have fully realized its potential. For example:

- Some PCI data acquisition cards don't even implement bus-mastering. They may have PCI connectors, but they're hardly "PCI data acquisition cards."
- Some use "matchmaker" PCI interface chips which take the ISA-bus registers and map them to the PCI address space. This simplifies the card designer's job, but doesn't give the user the real benefits of PCI (high speed, using less CPU time, etc.).
- Some designers have implemented the PCI interface properly, but have neglected to put any kind of processor on their card. The data acquisition card cannot independently execute the commands, and it ties up the host CPU while performing the data acquisition processes.

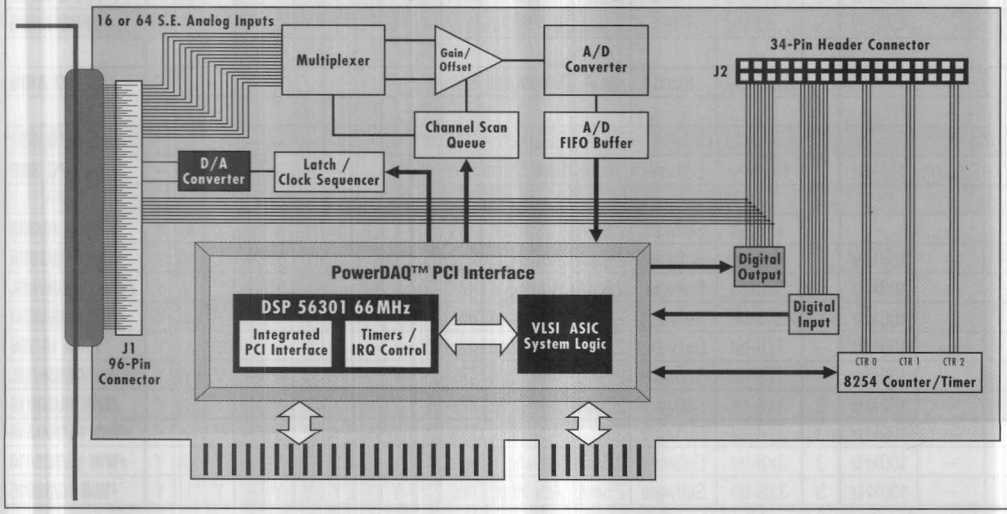
What is PowerDAQ™?

The bridge between the promise and the reality of PCI has arrived! CyberResearch is proud to announce the introduction of a new family of PCI data acquisition cards which take the fullest possible advantage of the 132 MByte/second PCI bus. Each PCI board features the unique PowerDAQ™ interface. PowerDAQ™ is a DSP-enhanced PCI interface which utilizes the 66MHz Motorola 56301 DSP with an on-chip integrated PCI controller. This is the only PCI card that actually *adds* power to your system.

The DSP processor is tied via a high-speed data bus to the system logic, which is implemented in a VLSI FPGA. This design approach increases the logical capacity of the board while greatly reducing the chip count, thereby improving reliability and keeping the board affordable.

PowerDAQ™ cards have been designed from the ground up to be fully PCI Revision 2.1 compliant and to offer optimal performance under **Windows 95** and **Windows NT** 32-bit operating systems. They make use of no legacy code and the design requires no "matchmaker" circuits (matchmaker chips allow ISA boards to be converted to use PCI slots without creating a true bus interface).

Simplified Block Diagram



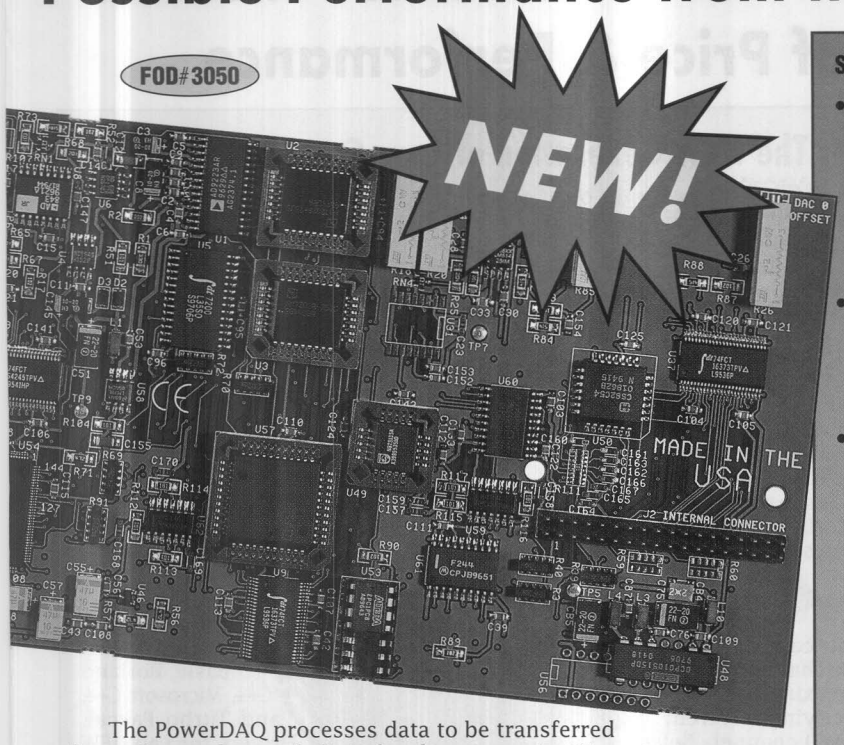
The Most Efficient Solution

The new PCI bus has incorporated technology which allows each PCI card in your system to become a "bus master," taking control of the system bus and becoming its own single-board computer. Each of our **PowerDAQ** cards takes advantage of this technology by using its powerful, on-board microprocessor as a "data pump" which processes interrupts, transfers data, coordinates operations, and acts as the arbiter between sub-systems on the board and between the PowerDAQ card and the PC's main processor. The result is high speed data acquisition accomplished without degradation of the PC's CPU performance. The PowerDAQ PCI interface lets you to use the power and speed of the PCI bus, instead of using all of your CPU's processing power for one card.

CyberResearch Assistance: Toll-Free 1-800-341-2525 (USA) ☎ **Tel: 203-483-8815 Fax: 203-483-9024**
Applications Engineers: Mon-Fri, 9 AM-5 PM U.S. Eastern Time • **Internet Website:** http://www.cyberresearch.com • **Fax-on-Demand System:** 203-483-9966 • **BBS:** 203-488-8949

Possible Performance from the 132 MHz PCI bus!

FOD#3050



The PowerDAQ processes data to be transferred from the analog and digital subsystems to PC system memory and vice versa. Each subsystem can operate independently and simultaneously with other subsystems. Because the PowerDAQ interface functions as a multi-threaded processor, a fatal error occurring in one process (A/D, for example), will not terminate operations running simultaneously (D/A or digital I/O, for example). The processor locates available system memory and streams data to free memory blocks, interrupting the host CPU only when the process is completed. This is a great leap forward in system security and stability.

Support for 32-bit Operating Systems

Supplied with each PowerDAQ card is a free set of our **UDAQ** Universal PowerDAQ software drivers, **including source code**. UDAQ software includes a VxD for Windows 95, and kernel-mode drivers for Windows NT. For maximum 32-bit compatibility, drivers have been developed under Windows NT and then optimized for Win95. The drivers support all relevant PCI features, including:

- PCI-bus PowerDAQ detection
- True Plug-n-Play support
- Bus-mastering block data transfers
- Multiple simultaneous command requests from concurrent Win32 application threads
- Concurrent request processing (multi-processor systems)

SPECIFICATIONS:

• Analog Input	Number of Channels:	16 single-ended or 8 differential (or 64 single-ended/32 diff. on **6400**)
	Resolution:	12 bits or 16 bits
	Acquisition Speed:	1 MHz (150 kHz for 16-bit models)
	Input Ranges:	0 to 10V, ±10V, 0 to 5V, ±5V
	Linearity:	Integral, ±0.5LSB, typical
• Analog Output	Number of Channels:	2
	Resolution:	12-bit
	Update Rate:	100 kHz
	Analog Output Range:	±10V
• Digital I/O	Input Bits:	8
	Input Low:	V_{IL} = 0.8V max; I_{IL} = –0.2mA max
	Input High:	V_{IH} = 2.0V max; I_{IH} = 20µA max
	Output Bits:	8
	Output Low:	V_{IL} = 0.55V max; I_{IL} = 24mA max
	Output High:	V_{IH} = 2.5V max; I_{IH} = –3mA max
	Output Current Sink:	24 mA
	Strobe Pulse Width:	300 nSec typical, data latched at rising edge
	Data Transfer Modes:	Interrupt or Programmed I/O
• Counter/Timers	Number of Counters:	3 available to the user (Intel 8254)
	Resolution:	16 bits on each counter
	Clock Input:	Softw. configurable; Internal: 1 MHz, External: ≤10 MHz
	Data Transfer Modes:	Interrupt or programmed I/O
	Input Low:	V_{IL} = 0.8V max @ I_{IL} = 20µA max
	Input High:	V_{IH} = 2.0V max @ I_{IH} = 20µA max
	Output Current:	I_{OH} = 20 mA; I_{OL} = 48mA
• Trigger Modes	Trigger Sources:	Software command, external. trigger, analog level; separate triggers start channel list processing and individual conversions in list
• General	Connector 1:	96-pin high-density connector (male)
	Connector 2:	34-pin header connector (male)
	Operating Environment:	0°C to 70°C (32°F to 158°F)
	Input Overvoltage:	–35V to +55V continuous, powered-on or non-powered
	Power Requirements:	5V @ 1A, ±12V @ 50mA
	Dimensions:	279mm x 98mm

Ordering Information: ***All boards have an on-board Motorola 56301 DSP.*** **Call our Fax-on-Demand System for more information 203-483-9966: FOD#3050**

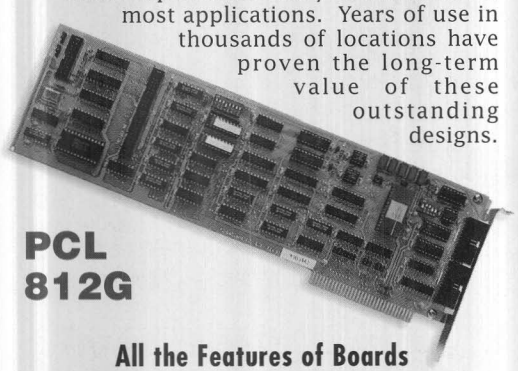
#PPD 1612	PowerDAQ Board for PCI: 1 MHz, 16 A/D Channels, 12-bit Resolution, 2 D/A Channels, 16 Digital I/O, 3 Counter/Timers*	**$1650**
#PPD 1616	PowerDAQ Board for PCI: 150 kHz, 16 A/D Chan., 16-bit Resolution, Gains of 1/2/4/8, 2 D/As, 16 Dig. I/O, 3 Counter/Timers*	**$1650**
#PPD 6412	PowerDAQ Board for PCI: 1 MHz, 64 A/D Channels, 12-bit Resolution, 2 D/A Channels, 16 Digital I/O, 3 Counter/Timers*	**$2495**
#PPD 6416	PowerDAQ Board for PCI: 150 kHz, 64 A/D Chan., 16-bit Resolution, Gains of 1/2/4/8, 2 D/As, 16 Dig. I/O, 3 Counter/Timers*	**$2395**
#PPD STP96	96+37-pin Screw Terminal Panel – has 96-pin and 37-pin connectors with screw terminals for all PPD board signals	**$225**
#PPD CBL96	96-pin Round Shielded Cable with metal cover plates, 1-meter length	**$99**
#PPD CBL372	2-Cable Set: two 37-pin cables, Internal cable w/Mounting Bracket and a 1-meter External cable (carries Digital I/O & Ctr/Timer signals)	**$55**
#PPD STPK	**Complete Kit:** 96+37-pin Screw Terminal Panel, 1-meter 96-pin Shielded Cable, and a 37-pin 1-meter Cable Set	**$349**
#PPD STP19R	Rack-Mounting Assembly for mounting the **PPD STP96** in a standard EIA 19" rack	**$55**
#PPD DRV-xx	3rd-Party Software Driver Packages for PowerDAQ Boards on CD-ROM, for Windows 95 & Windows NT (choose from the list below)	**$199**

3rd-party software drivers: **LV**=LabVIEW, **LW**=LabWindows CVI, **HP**=HP VEE, **TP**=TestPoint (TestPoint drivers were still being written at press time – call for availability).

** Call for current availability/delivery times of all models and an up-to-date software support list. Boards shown here were expected to be available in quantity at press time.*

PCL Data Acquisition Boards Give You the Right Combination of Price & Performance

CyberResearch is now able to offer a complete data acquisition system for an amazingly low price. Despite their affordability, these are full-featured cards with all of the capabilities that you will need for most applications. Years of use in thousands of locations have proven the long-term value of these outstanding designs.



PCL 812G

All the Features of Boards Costing Twice as Much

The **PCL 812G** offers:

- 16 single-ended analog inputs (A/D)
- 12-bit resolution
- Selectable gains of 1, 2, 4, 8, and 16
- 2 analog output channels (D/A)
- 30 kHz A/D conversion speed
- Jumper selectable input ranges
- 16 digital inputs & 16 digital outputs
- 3 programmable counter/timer channels (1 available to user)

Direct Memory Access, program transfer, and interrupt-driven data transfers are all supported. Analog outputs are double-buffered and can be referenced to an internal source of +5V or +10V (0-5V/0-10V), or to an external reference of 0 to V_{ref} (±10V max).

Of the 3 programmable counter/timer channels, one is dedicated to synchronize A/D and D/A operation, and one may be used as a pacer output to generate trigger pulses. The third is available as a 16-bit general purpose counter/timer for event counting and period or pulse measurement.

Software-Selectable Input Ranges

For the same price as our older PCL 812 model, you now get the **PCL 812G** with software-programmable gains added. The PCL 812G guarantees full resolution for each measurement and reduces the need for signal conditioning. This new functionality has been added at **no cost** to you.

FREE Driver Software Included with Board for C, Pascal, Basic, BASICA, & QuickBASIC

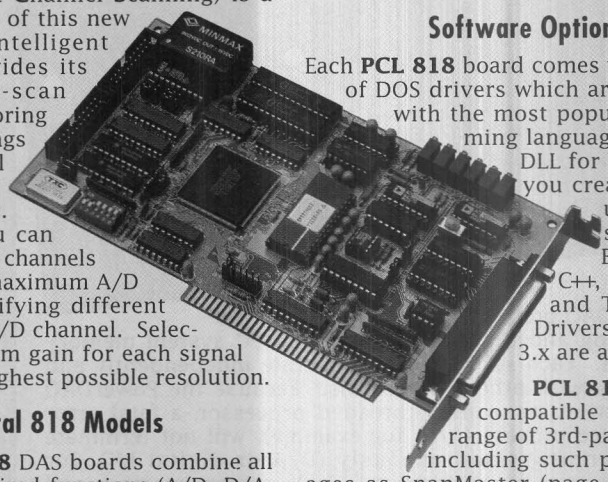
Programming routines written in C, Pascal, BASIC, BASICA, and QuickBASIC are included free of charge with each **PCL 818** and **PCL 812G** board. Helpful routines are supplied for installation, calibration, DMA data transfers, interrupt-driven transfers, and transducer linearization. A library of sample programs gives you a head start designing your own programs. Unlike some manufacturers, we include these programming necessities with each board, free.

PCL 818: The New Generation of Low-Cost Acquisition

The **PCL 812G** on this page is our best selling data acquisition board. But the designers of our PCL family have not been resting on their laurels. The PCL 818 family brings powerful new speed and features, at budget-conscious prices.

DMA Acquisition with Individual Gains

ACS (**A**utomatic **C**hannel **S**canning) is a primary benefit of this new design. The intelligent ASIC chip provides its own channel-scan logic circuit, storing individual settings for each channel in its on-board SRAM buffer. This means you can sample multiple channels at the board's maximum A/D rate while specifying different gains on *each* A/D channel. Selecting the optimum gain for each signal results in the highest possible resolution.



Several 818 Models

Our **PCL 818** DAS boards combine all of the most desired functions (A/D, D/A, digital I/O, & counter/timers) into a small, half-size package. The **PCL 818LC** is a lower-cost model with a sample rate of 40kHz, while the **PCL 818HG** gives you gains up to x1000, a 1K FIFO buffer, and it comes complete with a terminal panel with cold-junction compensation and a shielded 37-pin cable.

Lower gains (for higher voltages) are offered by the **PCL 818H**, a 100kHz A/D board with ranges of 0-10V, 0-5V, 0-2.5V, 0-1.25V, ±10V, ±5V, ±2.5V, ±1.25V, and ±0.625V. See charts on pg 66 for specs.

Software Options

Each **PCL 818** board comes with a library of DOS drivers which are compatible with the most popular programming languages. Optional DLL for Windows lets you create programs using tools such as Visual Basic, Borland C++, Microsoft C++, and Turbo Pascal. Drivers for LabVIEW 3.x are also available.

PCL 818 boards are compatible with a broad range of 3rd-party software, including such popular packages as SnapMaster (page 76), Labtech NOTEBOOK (page 76), & **Genie** (on the facing page). See the far right box (on the facing page) for special package deals, including ***GENIE Lite*** software.

PCL 818 Specifications

Analog Inputs (A/D)

Channels:	16 Single-Ended / 8 Diff.
Resolution:	12 bits
Conversion Rate:	100 kHz (PCL 818H/HD/HG) 40 kHz (PCL 818LC)
Full-Scale Range:	±5 V (All Models) 0 to 5 V (PCL 818H/HG)
Gains:	1, 2, 4, 8 (PCL 818LC/H/HD) 0.5, 1, 2, 4, 8 (PCL 818H/HD) 0.5, 1, 5, 10, 50, 100, 500, 1000 (PCL 818HG)

Analog Outputs (D/A)

Channels:	1 at 12 bits resolution
Settling Time:	30 µsec
Output Ranges:	0 to 5V, 0 to 10V 0 to ±10V w/ext ref.

Digital I/O

Channels:	16 inputs, 16 outputs
Compatibility:	Intel 8255 (8mA sink)
Counter/Timers:	3 Channels (Intel 8254)

Ordering Information: **Call Fax-on-Demand for info: 203-483-9966 FOD#3039** (812) & **3040** (818)

#PCL 812G	Multi-Lab Data Acquisition Board with Programmable Gains (20-pin connectors) **$395**
#PCL 818H	100 kHz Data Acquisition Board with Variable Gains & ACS (20-pin connectors) **$595**
#PCL 818LC	Low-Cost Version of PCL 818H: 40 kHz A/D with Bi-Polar (±V) Inputs only (37-pin) **$295**
#PCL 818LCP	PCL 818LC Complete Package w/PCL 8115C Terminal Panel, Cable, & *Genie Lite* Softw.. **$495**
#PCL 818HD	100 kHz DAS Board with Low Gains & ACS (37-pin) **$595**
#PCL 818HG	100 kHz DAS Board with High Gains & ACS (Includes PCL 8115C Terminal Panel & Cable)... **$695**
#PCL 8115C	Screw Terminal Panel w/CJC for PCL 818LC, HD, or 818HG, includes 3-ft. 37-pin Cable.... **$99**
#PCL VBX2 or **8**	Visual Basic Driver for PCL 812G, PCL 71 (**2**); or the PCL 818 Series (**8**) **$49**
#PCL LV2 or **8**	LabVIEW 3.x Driver for PCL 812G, PCL 71 (**2**); or the PCL 818 Series (**8**).... **$195**

DOS drivers & DLLs for Win 3.1 are supplied with each board. 32-bit Win95 & WinNT available on request. See facing page for complete packages with Genie Lite software. Call for info on additional terminal panels.

CyberResearch Assistance: Toll-Free 1-800-341-2525 (USA) Tel: 203-483-8815 Fax: 203-483-9024
Applications Engineers: Mon-Fri, 9 AM-5 PM U.S. Eastern Time • **Internet Website:** http://www.cyberresearch.com • **Fax-on-Demand System:** 203-483-9966 • **BBS:** 203-488-8949

*Is it possible to get comprehensive data acquisition and control software for Windows 95 without paying a thousand dollars or more? It is now — with **GENIE**!*

GENIE is a comprehensive data acquisition and control software package for use with Windows 95 or Windows 3.x. Designed with novice users in mind, *GENIE* has an intuitive, icon-based graphical interface that allows you to feel right at home in designing your own applications. Simply select I/O devices, control blocks, mathematical functions, or logical functions from the tool box, connect them together visually on the screen as you would a flow chart, set the timing parameters, and you have a working solution for your data acquisition & control applications, all in minutes.

GENIE features a *Strategy Editor* in which your control strategy is created by simply moving and connecting icon blocks. Each block represents a function such as an analog input, analog output, etc. Just arrange the blocks in the order you want them executed.

A *Display Editor* helps you easily design real-time displays such as instrument panels. **Without doing any programming** you can create color graphic screens with interactive elements such as push-buttons and slide bars.

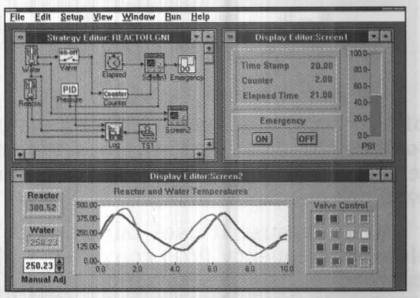
GENIE™ Data Acquisition Software for Lab & Industrial Automation

Outstanding features include:

- Windows DLL-based driver with DDE
- Closed-loop (PID) process control
- Real-time analysis functions
- Visual Basic Scripting Language*
- Report Generator Printing Capability*
- High-Speed Mode to 200 Hz
- Built-in thermocouple linearization & CJC handling for temperature input.

You can save your design and load it back for modification or enhancement. You can Copy, Paste, or Delete to create new strategies from old. With *GENIE* the setup process is as easy as 1-2-3.

***Genie Lite** is a low-cost version that does not include the Visual Basic Scripting Language or the Report Generator Printing Capability. It can be easily upgraded to the full version later (**PCL GENU** Upgrade to 3.0...**$300**).



Key *GENIE* performance features:

- **Real-time** data logging & real-time displays with adjustable update rate.
- **Sampling Rate** to 200 samples/sec.
- **Unlimited Number of I/O Devices** (Limited only by hardware.)
- **Unlimited Number of Blocks** (Limited only by system memory.)

Ordering Information: **Call Fax-on-Demand for more info: 203-483-9966 FOD#6017**

#**PCL GENIE** Complete *GENIE* 3.0 Software Package.....**$695**

#**PCL GENLT** *GENIE Lite* Package (Does not include V.B. Scripting Language or Report Generator)...**$395**

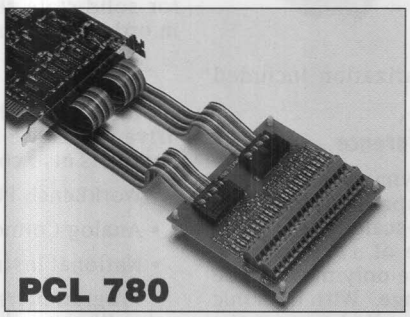
GENIE software is ideal for use with the CyberResearch models PCL 720, PCL 722, PCL 724, PCL 727, PCL 728, PCL 812G, PCL 818H, 818HD, 818HG, & PCL 818LC boards, and the ADAM-series modules.

Low-Cost Terminal Panel

We offer 2 economical options for interfacing to your signals. If you don't need a panel at all, the **PCL 1050** gives you cables and a backplate to simplify using the 32 digital I/O lines, plus 37-pin adapters for both the analog and digital I/O, and a 37-pin cable end for wiring directly to the board. Our **PCL 780** is actually a complete package consisting of the PCL 1050 cabling kit, a screw terminal panel, and compatible cables.

#**PCL 780** Terminal Panel w/Cable.....**$80**

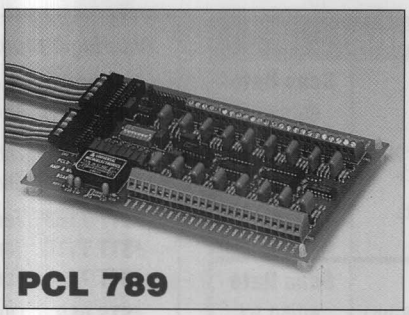
#**PCL 1050** Industrial Cabling Kit.....**$40**



Amplifier & Multiplexer Panel

The **PCL 789** Multiplexing Terminal Panel provides you with a high grade instrumentation amplifier for low level signals, thermocouple cold-junction compensation, signal filtering, signal attenuation, current shunting, and it multiplexes all 16 differential signals into one single-ended input channel on the **PCL 812G**. A daisy-chain connector allows cascading up to ten **PCL 789** panels to provide 160 differential analog inputs to one **PCL 812G** acquisition card.

#**PCL 789** Amplifier & Multiplexer Panel.....**$280**

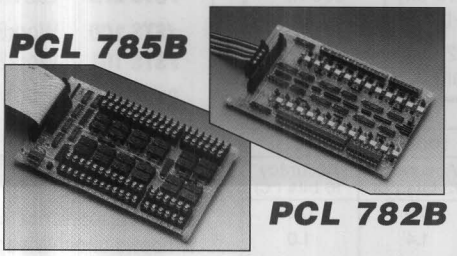


24-Channel Relay Panels

Our **PCL 782** and **PCL 785** terminal panels have been very popular, but their compatibility was limited. The "**B**" models offer all the same features, plus you get 8 extra relays or opto-isolators, and you have both 20-pin & 50-pin connectors. 20-pin & 50-pin 1-meter cables included.

#**PCL 782B** 24-Ch. Isolated Dig. Input Panel..**$170**

#**PCL 785B** 24-Ch. SPDT 1A Relay Panel.....**$210**



COMBINED PACKAGES provide Complete Solutions for under $1000

Special Package Pricing

With our new special packages at reduced prices, ***Genie Lite*** makes it possible to get easy-to-use data acquisition & control software for Windows, together with one of our most popular data acquisition boards, all for much less than $1,000.

Choose from 2 DAS boards to go with your ***Genie Lite*** software:

PCL 818LC 40kHz 16-Channel A/D Board, w/32 digital I/O lines & 1 D/A chan.; or

PCL 812G, our best-selling data acquisition board with 16 analog inputs, 2 analog outputs, 32 digital I/O, 3 counter/timer channels and programmable gains.

Combined Packages include:

- **PCL 812G** or **818LC** A/D Board
- ***Genie Lite*** Software
- A Matching Screw Terminal Panel
- Cabling to your A/D Board
- Utility Software & User's Manual

Special Pricing Offers

#**PCL 818LCP** PCL 818LC Package.....**$495**
Includes: PCL 818LC Data Acquisition Board, Terminal Panel, Cable, & Genie Lite Software.

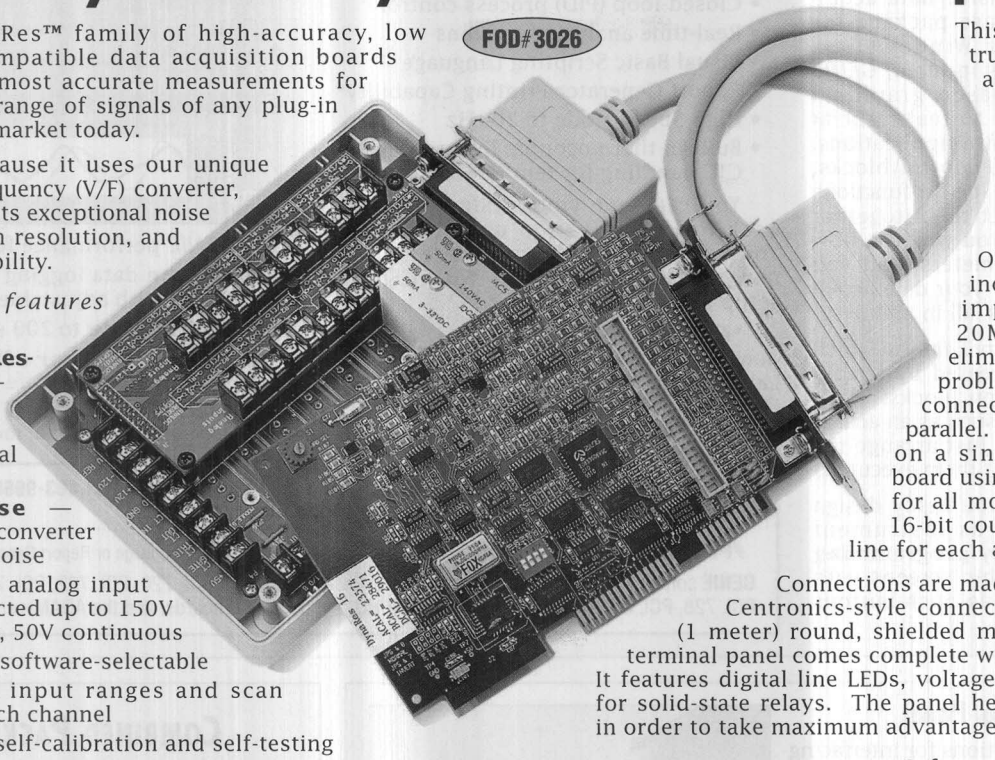
#**PCL 812GCP** PCL 812G Package.....**$795**
Includes: PCL 812G Data Acquisition Board, Terminal Panel, Cable, & Genie Lite Software.

Get the Most Accurate Measurements Possible with DynaRes™ Dynamic Resolution Input Boards

The DynaRes™ family of high-accuracy, low noise, PC-compatible data acquisition boards provides the most accurate measurements for the broadest range of signals of any plug-in board on the market today.

That's because it uses our unique Voltage-to-Frequency (V/F) converter, renowned for its exceptional noise rejection, high resolution, and long-term stability.

FOD#3026



Outstanding features include:

- **Dynamic Resolution** — resolution improves as the signal decreases
- **Low Noise** — integrating converter with 2 µV noise
- **Rugged** — analog input lines protected up to 150V momentary, 50V continuous
- Everything software-selectable
- Individual input ranges and scan rates on each channel
- Automatic self-calibration and self-testing
- Thermocouple compensation and RTD linearization included in the driver

Dynamic Resolution Makes the Difference

This performance is achieved by means of dynamic resolution. Standard data acquisition boards (successive approximation type) have a fixed resolution over the maximum full-scale range. With 12-bit resolution and a typical full-scale range of ±10V, this results in resolution of ±4.88mV, even when you're only making use of a small portion of the maximum full-scale range. With dynamic resolution, in contrast, the full resolution is applied to just the range which is of interest for the signal you are measuring.

This dramatically increases the true (as opposed to the stated) accuracy and resolution of your measurement – by as much as several orders of magnitude when you are measuring low-level signals.

Improved Board Design

Other notable improvements include: 50% less noise, input impedance now greater than 20MΩ on all ranges, and the elimination of channel cross-talk problems often encountered when connecting several instruments in parallel. The product family is based on a single design: a 4-layer base board using surface mount components for all models. Each board includes a 16-bit counter/timer and a digital I/O line for each analog channel (8 or 16).

Connections are made via a D-type 50-pin female Centronics-style connector which mates to a 3-foot (1 meter) round, shielded male-male cable. Our STT 71 terminal panel comes complete with a 50-pin cable and a case. It features digital line LEDs, voltage/current switches, and room for solid-state relays. The panel helps maintain signal integrity in order to take maximum advantage of DynaRes accuracy.

Software

Included with each DynaRes board is the new QuickLog menu-driven software for Windows (Win3.x/95). The DynaRes family of boards is also compatible with the following additional software:

- WorkBench PC for Windows & WorkBench PC for DOS
- Analog Connection Development System for Windows
- National Instruments' LabVIEW™ driver available

Programmers wishing to write their own software (instead of using WorkBench PC software) should order the Analog Connection Development System, a driver package for Windows 3.x & Win95.

Resolution vs. Scan Time*

DynaRes Mode	Dynamic Resolution	Scan Rate
Low Noise	0.0004% (equivalent 18-bit)	60/50 Hz
Normal	from 0.024% (equivalent 12-bit) to 0.003% (equivalent 15-bit)	1200 Hz
Fast	from 0.1% (equivalent 10-bit) to 0.01% (equivalent 13-bit)	1700 Hz
DynaRes Ultra Mode	**Dynamic Resolution**	**Scan Rate**
Low Noise	from 0.0004% (equivalent 18-bit) to 0.00009% (equivalent 20-bit)	60/50 Hz
Normal	from 0.0015% (equivalent 16-bit) to 0.0002% (equivalent 19-bit)	200 Hz
Fast	from 0.024% (equivalent 12-bit) to 0.003% (equivalent 15-bit)	900 Hz

Recommended Resistor Values for a 100Ω RTD

Resistor Ohms	Temperature Range °C	Resolution 12 bits (°C)	Resolution 16 bits (°C)	Accuracy 12 bits (°C)	Accuracy 16 bits (°C)
20kΩ	–200 to +115	0.02 to 0.1	0.005	0.9	0.8
50kΩ	–200 to +750	0.05 to 0.2	0.01	1.4	1.0
100kΩ	–200 to >850	0.1 to 0.5	0.03	2.1	1.4

Ordering Information: **Call Fax-on-Demand: 203-483-9966 FOD#3026**

#DYR 8	*DynaRes™* 8-Channel Analog Input Board	**$695**
#DYR 16	*DynaRes™* 16-Channel Analog Input Board	**$1195**
#DYR 8U	*DynaRes™ Ultra* 8-Channel Analog Input Board	**$1195**
#DYR 16U	*DynaRes™ Ultra* 16-Channel Analog Input Board	**$1795**
#STT 71GP	Terminal Panel w/enclosure & 3-ft cable (General Purpose)	**$249**
#STT 71TC	Terminal Panel & Cable w/Encl. (Thermocouple)	**$399**
#STT 71-XXX	Terminal Panel & Cable w/Encl. (RTD – Specify Ω**)	**$329**
#STS 052	Quicklog Software for Windows 3.x/Win95	**$N/C**
#STS ACW	Analog Connection Development Sys. for Win3.x/Win95	**$499**
#STS LVD	LabVIEW Driver Package (for Version 3.x and 4.x)	**$249**
#STS 100	WorkBench PC Software – Base Edition (Win3.x or Win95)	**$995**
#STS 101	WorkBench PC – Extended Edition (for Win3.x or Win95)	**$1295**

QuickLog™ menu-driven software is **included FREE** with DYR boards. QuickLog is a Windows program with a graphical user interface which will help get you up-&-running quickly. **Note: Please replace **xxx** with resistor value in kΩ for ideal temperature range & accuracy – see Resistor Values chart (at left, bottom of page) for examples.

*Scan rates describe an IBM PC 486DX/2-66MHz running WorkBench PC for Windows under Windows 3.1.
Tolerate error rate = 0. Rates are faster in faster computers.

CyberResearch Assistance: Toll-Free 1-800-341-2525 (USA) ☎ **Tel: 203-483-8815 Fax: 203-483-9024**
Applications Engineers: Mon-Fri, 9AM-5PM U.S. Eastern Time • **Internet Website:** http://www.cyberresearch.com • **Fax-on-Demand System:** 203-483-9966 • **BBS:** 203-488-8949

Direct Sensor Input to your PC

CyberResearch Universal PC (UPC) Direct Sensor Input cards will accept up to 16 analog sensor signals directly without the need for any external signal conditioning modules. Any combination of thermocouples, RTDs, thermistors, strain gauges, LVDTs, etc., can be wired directly to UPC-series boards. Each channel can be individually programmed to accept any type of sensor with any input range. Each UPC card provides **14-bit resolution** and 11 stages of programmable gain amplification to ensure accurate measurement from a variety of signal sources. Measurement accuracy, for example, is rated to 0.05°C typical for thermocouples and RTDs. Supported input types include:

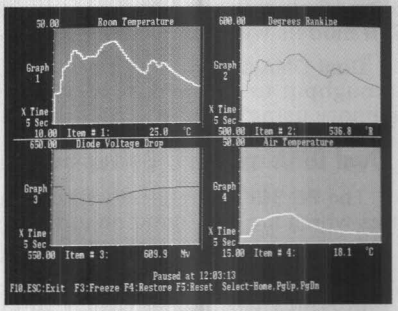
- Thermocouples: types B, E, J, K, T, R, S linearized output.
- RTDs: 10Ω to 2kΩ, α = .00392 or .00385. Platinum, nickel, copper, and thermistor probes w/3- or 4-wire configurations.
- LVDTs, RVDTs, VRs: 2.5mV/V to 1280mV/V full scale. 4VAC, 5kHz/10kHz selectable excitation provided.
- Strain Gauges: Sensitivity to ±2.5 mV/V FS. ±1250µstrain FS, resolution, 0.15µstrain typical. 4VDC precision excitation.
- Voltage: ±10mV to ±10.24V FS, single-ended or differential.
- Resistance: 10Ω to 12kΩ, full scale.

Two Different Models for Different Applications

Our **UPC 608** is the general purpose workhorse of the direct sensor line. It features two analog output channels (configurable as ±10VDC or 4–20mA) and 16 digital I/O bits which may be independently set for input or output. Excitation sources include a precision current source for RTDs, 4VAC for LVDTs, and 4VDC for strain gauges. Over-voltage protection of ±20V_{PK} (power off) and ±35V_{PK} (power on) protects your computer. Common mode rejection is ±10V. On-board EEPROMs store all calibration factors for each channel. Up to 14,000 samples can be stored to a programmable sequential storage buffer. Frequency inputs can accept signals with frequencies from 0.02Hz to 50kHz with 16-bit resolution (2 freq. input channels on the UPC 608, 1 input on the UPC 601). Both boards are capable of up to 20,000 conversions per second.

Most A/D boards cannot be used in portable computers because the boards require –12V power, which portable computers cannot usually supply. Since our half-length card does not require –12V power, **the UPC 601 is perfect for use in any portable PC** which includes an ISA-bus expansion slot. This makes the lower-cost UPC 601 a perfect component of a portable data acquisition system. A compact half-length card, it squeezes in nearly all the features of the larger **UPC 608** (including the impressive 20kHz conversion speed). With the included software and terminal panel, the UPC 601 gives you a complete data acquisition system. Please note that the UPC 601 does not include the analog output channels or the digital I/O lines supplied on the UPC 608, and has only 1 frequency input.

All conversion to engineering units is handled by the **Easy Sense** software. Menu choices show you all the permissible transducer types. You just choose the transducer you're using (thermocouple, RTD, thermistor, strain gauge, LVDT, or direct voltage input) and the software does the rest. Input ranges are individually selectable on each channel, and only appropriate choices are offered. For example, the input range choices for a J-type thermocouple are presented to you in degrees C. This new Windows version includes an Auto-Zero function, allowing you to instantly zero any reading. You can instantly view any input, right in the setup screen.



New Windows software makes it easy.

Simplify your Work

The tight integration between hardware and software means that your work is tremendously simplified. Easy Sense understands exactly how your A/D board works, so you're always dealing with engineering units, rather than abstract concepts. The Windows interface makes Easy Sense an ideal A/D solution.

In addition to the **Easy Sense** menu-driven software included with each UPC card, BASIC and C driver code is also provided for those who wish to develop their own applications. Drivers for **Labtech NOTEBOOK** (page 76) are provided free when NOTEBOOK and a UPC-series card are purchased together.

Accessories

Both of our UPC Direct Sensor Input Cards **come with a screw terminal block and cable** for easy connection of your sensors to the board's analog input channels. The analog outputs, frequency inputs, and digital I/O lines featured on our **UPC 608** cards are on a separate connector (the rear panel of the card is notched for easy cable connection). Our **UPC 12893** is a specially-designed terminal block for making connections to these features simple. It requires the **UPC 12953** cable to connect the terminal block to your UPC card. There are no additional accessories for the **UPC 601** half-length card, beyond the cable and terminal panel supplied with the board.

Ordering Information: **Call Fax-on-Demand: 203-483-9966 FOD#3041**

#UPC 601	Half-Length Direct Sensor Input Card	**$1795**
#UPC 608	Full-Length Direct Sensor Input Card	**$2195**
#UPC 12893	Terminal Block for Frequency Input, Analog Output, and Digital I/O	**$225**
#UPC 12953	Cable from UPC Card to 12893 Terminal Block	**$25**

Each UPC card comes complete with Easy Sense software, BASIC & C driver code, and a terminal panel with cable.

PC 30 Combines the Best Features on One Board: 16 A/D Inputs, Dual DMA, 24 Digital I/O & 4 DACs

The **PC 30** family offers much more than 16 channels of analog input — other important features include dual DMA, 24 digital I/O lines, and an extensive software library, including WaveView software. The **S4** & **S16** models include on-board simultaneous sample-and-hold circuitry for up to 16 single-ended channels. The "**A**" versions add 4 channels of digital-to-analog conversion (D/A). Use the comparison chart on pages 44 to 47 to compare the different features on the PC 30 series vs. other multi-function boards. For applications that require analog and digital I/O, the PC 30 offers **a complete solution on a single board.**

The **PC 30G** was designed for applications requiring data conversion rates less than 100 kHz, while the **PC 30F** handles needs up to its faster 330 kHz conversion rate. The basic **PC 30F/G** boards offer 16 single-ended or 8 differential input channels; the **S4** and **S16** models with sample-and-hold have single-ended inputs only.

Dual-DMA support and a 16-sample FIFO buffer allow maximum throughput to PC memory. Data may be transferred to your PC's memory using DMA, interrupt-driven I/O, or via programmed I/O.

Dual DMA and FIFO Buffer Guarantee Optimum Performance

The **PC 30F/G** architecture implements several advanced capabilities which are not found on any other boards in this price range:

- **Dual DMA** means that your PC can set up a second 128KByte DMA buffer while the first one is being filled. This process provides the most efficient data transfer method and creates sample sizes limited only by your PC's memory.
- A **16-Word FIFO** (**F**irst **I**n, **F**irst **O**ut) buffer simplifies software development and guarantees error-free data transfers at the full acquisition speed of 100 kHz (**PC 30G**) or 330 kHz (**PC 30F**).
- **Channel-scan sequencing** achieves different effective sample rates on different channels, and **block triggering** samples any number of channels at near-simultaneous rates.

Software-Programmable Gains

The **PC 30F/G** provide software-selectable input ranges of either ±5V or ±10V, with a 0 to 10V range available on the PC 30G. Both models have programmable gain ranges of 1, 10, 100 and 1000. Gain ranges are **individually-selectable** per channel, with **full 330 kHz** throughput for the **PC 30F**, at all gain ranges under 1000 (100 kHz sampling with gain of x1000.) The **S4** and **S16** have a ±5V input range only, with software-selectable gain ranges.

Eliminate Timing Errors with our Simultaneous-Sampling Option

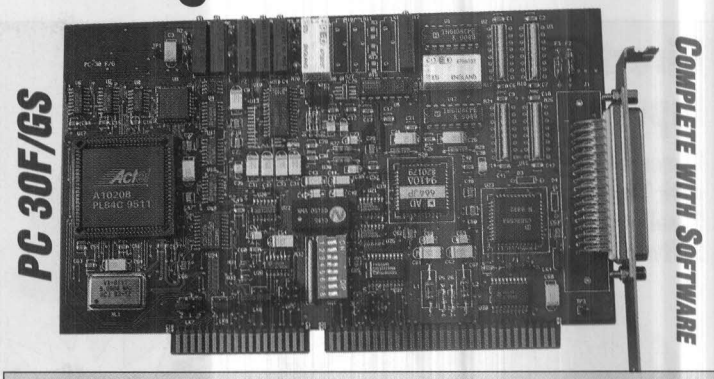
When you're measuring multiple channels of data, time skews caused by A/D multiplexers can cause significant errors. To compensate for this problem, some A/D boards offer external sample-and-hold panels which are expensive and complicated. Our **PC 30F/G** with the **S4** or **S16** option eliminates all that, providing sample-and-hold hardware *right on the board itself.* **Hundreds of dollars less expensive** than competing solutions, this still allows up to 330 kHz data acquisition and full DMA support. Our model **S16** can sample all 16 single-ended channels simultaneously, while the **S4** can sample four of its sixteen single-ended channels at once. Aperture uncertainty is only **300 picoseconds** within a group of 4 channels, and only 20 nanoseconds on the **S16** across the entire group of 16 channels.

4 D/As & 24 Digital I/O Lines — Twice the Usual Number

The PC 30 is not just an A/D board, however. It includes a full complement of all the most widely-requested I/O capabilities:

- 4 Analog Outputs (D/As): Two 12-bit & Two 8-bit (some models)
- 24 Digital I/O Lines (configured as 3 blocks of 8 bits each)
- 1 user-accessible 16-bit Counter/Timer for pulse & frequency

Two of the analog output channels provide 12-bit resolution, while the remaining two offer 8-bit resolution. All four are capable of an impressive 130 kHz D/A throughput/update rate.



The Most Complete Library of FREE Software

Each **PC 30** comes to you supplied with the most extensive collection of free software available. Included with each board:

- Device Drivers for major programming languages including Delphi & Visual Basic, plus **Windows 95 & Win3.x DLLs!**
- Source code drivers in C
- High-speed Data Streaming-to-Disk software
- Drivers for **HP VEE**, **DASY*Lab***™, **TestPoint**™, & **LabVIEW**™
- **WaveView**™ menu-driven data acquisition software
- Calibration and Demo program with source code

New High-Speed Disk Streaming Software

This latest addition to our free software transfers data direct to disk at the PC 30's **full 330 kHz acquisition rate** under Windows and DOS. The sample size is limited only by the size of your hard disk. The Win3.x/Win95 version is a DLL (dynamic link library) and VxD (virtual device driver) combination. High-speed sampling under Windows is through the advance VxD based driver. Our VxD driver does not replace the Virtual DMA Driver (VDMAD) built into Windows, so it will not conflict with other programs. All normal features of data acquisition are supported in streaming mode, including individual gains per channel and simultaneous sampling.

Source Code & Device Drivers in C, Pascal, Fortran, QuickBASIC

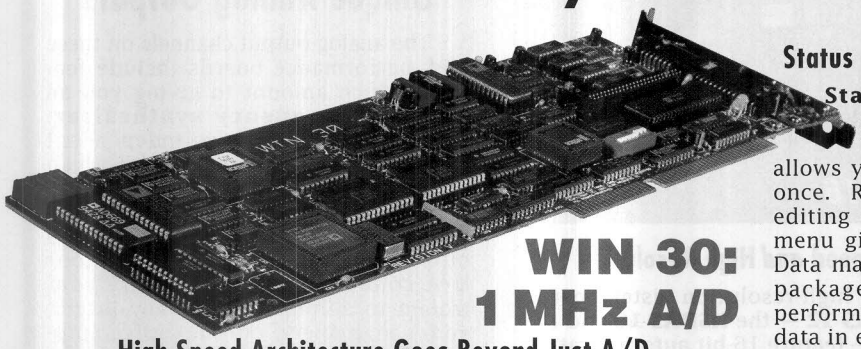
Our software driver package provides access to all board functions, with interfaces to MS C, TurboC, TurboPascal, QuickBASIC, MS FORTRAN, & Assembler. **Source code in C** is supplied for non-streaming drivers as a reference for register-level programming (source code for streaming drivers is not available).

Ordering Information: **Call Fax-on-Demand: 203-483-9966 FOD#3038**

#PC 30G	100 kHz 16 S.E./8 Diff. Channel Data Acquisition Board	**$495**
#PC 30GA	100 kHz 16 S.E./8 Diff. Ch. A/D Board w/4-DAC Ch	**$695**
#PC 30GS4	16 S.E. Channel A/D Board w/4-Channel Simultaneous	**$695**
#PC 30GAS4	16 S.E. Ch. A/D w/4-Chnls Simultaneous, 4-DAC Ch	**$995**
#PC 30GS16	16 S.E. Ch. Simultaneous-Sampling A/D Board	**$895**
#PC 30GAS16	16 S.E. Ch. Simultaneous-Sampling w/4-DAC Ch	**$1195**
#PC 30F	330 kHz 16 S.E./8 Diff. Channel A/D Board	**$595**
#PC 30FA	330 kHz 16 S.E./8 Diff. Ch. A/D Board w/4-DAC Ch	**$795**
#PC 30FS4	16 S.E. Channel A/D Board w/4-Channel Simultaneous	**$795**
#PC 30FAS4	16 S.E. Ch. A/D w/4-Chnls Simultaneous, 4-DAC Ch	**$1095**
#PC 30FS16	16 S.E. Ch. Simultaneous-Sampling A/D Board	**$995**
#PC 30FAS16	16 S.E. Ch. Simultaneous-Sampling w/4-DAC Ch	**$1395**
#PC 30NT	Software Driver Package for **Windows NT** (32-bit)	**$99**
#INST 347A	Screw Terminal Block w/6-foot cable for PC 30 Boards	**$135**

CyberResearch Assistance: Toll-Free 1-800-341-2525 (USA) ☎ Tel: 203-483-8815 Fax: 203-483-9024
Applications Engineers: Mon-Fri, 9AM-5PM U.S. Eastern Time • **Internet Website:** http://www.cyberresearch.com • **Fax-on-Demand System:** 203-483-9966 • **BBS:** 203-488-8949

Windows® NT ushers in full 32-bit support for our WIN 30™ Family of Data Acquisition Boards



WIN 30: 1 MHz A/D

High Speed Architecture Goes Beyond Just A/D

The **WIN 30D**'s entire A/D architecture has been engineered to achieve data acquisition performance never previously reached by any ISA-bus board at any price. Each element has been carefully considered to optimize throughput, with unique features built-in:

On-board DSP chip coordinates real-time activities independent of host PC's CPU for faster operation.

High speed data transfer modes allow greater than 1 MHz data transfer to PC memory (call for details).

Data packing fits four 12-bit samples into three 16-bit Words, meaning that data transfer instructions are reduced by 25% and data transfer rates are increased accordingly.

On-board FIFO buffers guarantee no lost data.

Block scan mode provides near-simultaneous sampling on a block of channels, sampling all channels within 16 µseconds.

Channel scan list in hardware specifies the sequence in which input channels should be scanned and maintains 1 MHz acquisition rate on active scanned channels.

16-Channel High-Speed Multiplexer Panel

Designed for large point-count systems, the WIN MUX16 lets you expand the input capability of the WIN 10/30 boards from 16 single-ended inputs to as many as 4096 differential A/D channels, at up to a full 1 MHz sampling rate. Two WIN MUX16 panels are needed for 16 A/D channels (master and slave); each additional panel adds 16 channels. Supplied with interconnecting cables.

WIN 10/30 Boards Include a Full Complement of Software

With every WIN 10 or WIN 30 data acquisition board you'll receive a CD filled with all the software you need to get your application running. Optional software is also included on the CD which is unlockable with a password. This means that you receive access to the software the moment you decide to purchase it, with no waiting for delivery and no paying for shipping and handling.

Included on the CD at no charge are:

- Menu-driven software: Status/Windows & Status/DOS
- VxD (low-level virtual device driver) for Windows 3.1/95 which handles time-critical operations & eliminates Windows latency
- Kernel mode (low-level) driver for Windows NT
- 32-bit DLL library of I/O commands for Windows 95/Win NT
- 16-bit DLL (Dynamic Link Library) for Windows 3.1/DOS
- Source code for DLLs (Visual C++ Ver. 5.0)
- Demo programs help explain the use of all DLL commands
- Source code for demo programs (Visual BASIC/Visual C++)
- On-line HELP manual

Included on the CD & unlocked with your purchase are:

- WIN DRV – Drivers for all popular 3rd-party software such as LabVIEW VI Library, LabWindows/CVI, TestPoint, SnapMaster, HP VEE, DASY*Lab*, Labtech NOTEBOOK, & ATEasy (All of them for **$149**)
- WINStream – DOS application for high-speed stream-to-disk (**$495**)
- Full source code to the WINStream application software (**$1995**)
- WIN QNX – Drivers for the QNX operating system (**WIN QNX** – **$499**)

Status 30 Menu-Driven Software Gets You Up & Going Sooner

Status 30 for Windows is an advanced menu-driven program featuring a graphical interface, pull-down menus, and context-sensitive help. Multi-processing allows you to view and process multiple sets of data samples at once. Real-time displays are supported, as well as viewing and editing of data currently displayed on the graph. An **Options** menu gives you flexible control of the file format of your data. Data may be saved in formats compatible with popular software packages like Excel and MathCAD. The **Analyze** menu will perform Chirp-Z and FFT transforms, allowing you to view your data in either the time or the frequency domain.

WINStream software is an application program which runs under DOS (in order to minimize software overhead and maximize data throughput). It is entirely menu-driven & saves digitized data from your A/D board directly to your hard disk at speeds up to **1 million samples/second**. Acquired data can be displayed in graphical formats. While our DLL library provides you with stream-to-disk functions, WINStream uses our most powerful streaming technology.

Ordering Information: **Call Fax-on-Demand: 203-483-9966 FOD#3042-44**

#WIN 10D	12-bit, 400kHz ISA-Bus Data Acquisition (A/D) Board	**$695**
#WIN 10DA	12-bit, 400kHz A/D Bd. w/2 D/A 16-bit Channels	**$895**
#WIN 10GH	12-bit, 400kHz A/D Board w/Low-Level Progr. Gains	**$1195**
#WIN 10GL	12-bit, 400kHz A/D Board w/High-Level Progr. Gains	**$1195**
#WIN 10S	12-bit, 400kHz 16-Channel Simultaneous Sampling A/D Bd.	**$1295**
#WIN 10S4	12-bit, 4-Channel Simultaneous Sampling A/D Board	**$995**
#WIN 10GSL	Simul. Sampling on 8 Diff. Channels, Low Prog. Gains	**$1395**
#WIN 10GSH	Simul. Sampling on 8 Diff. Channels, High Prog. Gains	**$1395**
#WIN 10D16	16-bit, 100kHz ISA-Bus Data Acquisition (A/D) Board	**$695**
#WIN 10DA16	16-bit, 100kHz A/D Bd. w/2 D/A 16-bit Channels	**$895**
#WIN 10S16	16-bit, 100kHz 16-Channel Simul. Sampling A/D Board	**$1295**
#WIN 10S416	16-bit, 100kHz 4-Channel Simul. Sampling A/D Board	**$995**
#WIN 30D	12-bit, 1 MHz ISA-Bus Data Acquisition (A/D) Board	**$1250**
#WIN 30DA	12-bit, 1 MHz A/D Bd. w/4 D/A Chan. (2@12-bit, 2@16-bit)	**$1495**
#WIN 30GH	12-bit, 1 MHz A/D Board w/Low-Level Progr. Gains	**$1625**
#WIN 30GL	12-bit, 1 MHz A/D Board w/High-Level Progr. Gains	**$1625**
#WIN 30S	12-bit, 750kHz 16-Channel Simultaneous Sampling A/D Bd.	**$1875**
#WIN 30S4	12-bit, 4-Channel Simultaneous Sampling A/D Board	**$1625**
#WIN 30GSL	Simul. Sampling on 8 Diff. Channels, Low Prog. Gains	**$2250**
#WIN 30GSH	Simul. Sampling on 8 Diff. Channels, High Prog. Gains	**$2250**
#WIN 30D16	16-bit, 200kHz ISA-Bus Data Acquisition (A/D) Board	**$1250**
#WIN 30DA16	16-bit, 200kHz A/D Bd. w/4 D/As (2@12-bit, 2@16-bit)	**$1495**
#WIN 30S16	16-bit, 200kHz 16-Channel Simul. Sampling A/D Board	**$2125**
#WIN 30S416	16-bit, 200kHz 4-Channel Simul. Sampling A/D Board	**$1875**
#INST 347Z	Screw Terminal Block with 18-inch Shielded Cable	**$165**
#WIN BNC	BNC Terminal Interface with 18-inch Shielded Cable	**$395**
#WIN MUX16	16 S.E./8 Diff. Input Multiplexer Panel with Cable	**$395**
#WIN STD	Hi-Speed Streaming-to-Disk Software (Runtime Version)	**$495**
#WIN STDSC	Hi-Speed Streaming-to-Disk Software (w/full Source Code)	**$1995**
#WIN DRV	Drivers for 3rd-Party Data Acquisition Software, on CD-ROM including drivers for: LabVIEW w/Virtual Instrument Library & Analysis VIs, LabWindows CVI, HP VEE, TestPoint, DASY*Lab*, SnapMaster, Labtech Notebook, & ATEasy	**$149**

Developer's Software Package included FREE with each order — includes: STATUS Menu-Driven Software (DOS & Windows versions), VxD Driver for Windows 3.1/Win 95, Kernel Mode Driver for Windows NT, DLL Library of Commands (includes source code in Visual C++), and Demo Programs to help explain the use of all commands in Visual BASIC / C++.

See pg 48 for our NEW PCI-Bus PowerDAQ Series!

High Speed *and* High Resolution

CyberResearch is proud to offer some of the most powerful AT-bus DAS boards ever made. Our HSDAS/LSDAS family uses a unique design to combine high-speed simultaneous sampling with high resolution.

The **HSDAS 12** features:

- 400,000 samples per second
- 12-bit resolution
- 16 analog input channels (configurable as 16 single-ended or 8 differential)

The **HSDAS 12** achieves such performance by using **4 independent A/D converters**, each running at 100 kHz. This unique design allows four channels to be sampled in **true simultaneous** mode without requiring any peripheral hardware. Aperture uncertainty is only 25 *nanosec.*

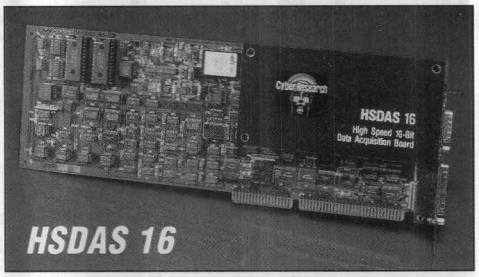
Unipolar/bipolar mode, full-scale input ranges, and single-ended/differential mode are individually software-selectable for each of the 4 A/D converters. A 128-Word FIFO buffer (4K optional) prevents data loss during transfers to PC system memory.

Highest Possible DMA Transfer Rate

The **HSDAS/LSDAS** family can perform DMA data transfers at the full speed of the A/D converter circuitry. This unique high-speed DMA controller takes full advantage of the 16-bit ISA/AT bus to provide one of the highest DMA data transfer rates for continuous acquisition to PC memory.

Anti-Aliasing Low-Pass Filters

If you are sampling signals with different frequencies, our HSDAS boards may be the perfect solution – a 400 kHz board can accurately sample signals to 200 kHz. But if your signal has high-frequency components at or near your sampling rate, it's possible to accidentally interpret a low-frequency signal as a much higher-frequency one. Our **low-pass filter cards** (page 57) are a perfect match to our HSDAS/LSDAS-series A/D boards. They can help to resolve this unusual source of error by only passing through signals in the desired frequency range.



High Speed *and* High Resolution

Our two high-resolution sister boards to the **HSDAS 12** — the **HSDAS 16** and the **LSDAS 16** — feature 16-bit autocalibrating A/D converters. They are capable of 200,000 and 50,000 samples/second, respectively.

Relative accuracy is ±0.003% of full scale, maximum. This means that a thermocouple with a range of 500°C can be repeatable to within 0.015°C. Absolute accuracy is rated at an excellent ±0.015% of full-scale, max. Like the **HSDAS 12**, these boards offer:

- 16 analog input channels
- 2 analog output channels
- 16 digital I/O lines (up to 24 mA sink)
- Six 82C54 counter/timers for pacing and trigger control. Five of the six are used for A/D and D/A timing control, but the sixth is available to the user for event counting, one-shot generation, etc.

NEW Low-Cost High-Res Board!

By dispensing with the D/A channels, our **LSDAS 16AC** reduces the cost of *true* 16-bit accuracy, providing those with smaller budgets a top-of-the-line A/D converter.

High Resolution on Hundreds of Signals

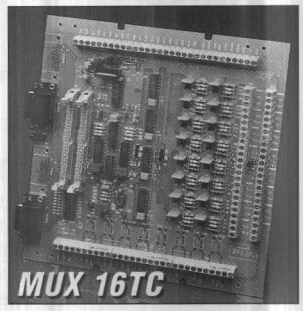
Each **SMUX 64** terminal panel will accept up to 64 single-ended or 32 differential input signals. Up to 4 **SMUX 64** panels may be daisy-chained for very high point-count systems. The multiplexer switching operation is pre-programmed and controlled by the DAS board. This means it can switch fast enough to allow the **HSDAS 12 to run at its full 400 kHz speed**.

Unique Analog Outputs

The analog output channels on these high-performance boards include features which amount to giving you an **on-board frequency synthesizer**. Each board provides two independent Digital/Analog converters, each with an internal de-glitcher to suppress digital input data transients. Software-controlled autocalibration eliminates output offset and gain errors. Your D/A conversions are hardware controlled to eliminate frequency jitters, and a high-speed output buffer amplifier improves data transfers.

An optional 32K-sample DAC buffer (**SDAS 32M**) allows your DAS board to generate waveforms independently of the PC host. Data points can be delivered to the D/A converter from DAC RAM at the full 330kHz speed, under programmed I/O control from the host, or under DMA control. No other D/A converter provides all these features.

The **MUX 16TC** connects up to 16 conditioned signals to a high performance instrumentation amplifier board. Individual channels may be jumper-configured to provide low-pass signal filtering. Cold Junction Compensation (CJC) is provided by a solid-state temperature sensor.



Software routines in "C" come with the MUX 16TC for selecting channels and programmable gains, cold junction compensation and **thermocouple linearization**.

Terminal panels come supplied with all necessary cables. See the chart on pp. 44-47 for further technical specifications. See facing page for low-pass filter cards.

Menu-Driven and Programmable Software

Our HSDAS/LSDAS family has several software options:

1. We include user-friendly set-up and demonstration programs free with each of our **HSDAS** and **LSDAS** boards. The set-up program allows you to specify all the operational parameters for the board and saves your choices in a configuration file. Various configuration files can be created and can be called from high-level programs.
2. If you wish to write your own programs, a set of high-level software drivers (**ALS 100**) is available separately which provides interfaces to Microsoft C and Borland C.
3. The HSDAS and LSDAS boards are compatible with several third-party software packages, including **LABTECH NOTEBOOK, DriverLINX,** and **SnapMaster** for Windows.
4. A driver package provides easy access to **LabVIEW**.®

LabVIEW® is a registered trademark of National Instruments Corporation.

Ordering Information: **Call Fax-on-Demand: 203-483-9966 FOD#3035**

#HSDAS 12A	500 kHz, 12-bit DAS Board with High-Speed DMA, 2 D/As	**$1895**
#HSDAS 12	400 kHz, 12-bit DAS Board with High-Speed DMA, 2 D/As	**$1695**
#HSDAS 16	200 kHz, 16-bit DAS Board with High-Speed DMA, 2 D/As	**$1695**
#LSDAS 16AC	50 kHz, 16-bit DAS Board (No D/As) **FOD#3036**	**$895**
#LSDAS 16	50 kHz, 16-bit Data Acquisition Board, 2 D/As	**$1295**
#SDAS 4KF	4K FIFO (upgrades A/D FIFO Buffer from 128 to 4096 samples)	**$150**
#SDAS 32M	32K-Sample Buffer for Analog Output (D/A Buffer)	**$200**
#SDAS SQ2	*Qwik Connect* Low-Cost Terminal Panels (set of 2)	**$150**
#SDAS STB	Shielded Terminal Box with 20- & 30-Pin Cables	**$395**
#SMUX 64	64-Channel High Speed Multiplexer Panel	**$920**
#SMUX 64D	Additional Multiplexer Panel with cable for daisy-chaining	**$575**
#MUX 16TC	16-Channel Thermocouple Panel with cables	**$599**
#MUX 16EX	16-Channel Expansion Panel with cable for daisy-chaining	**$345**
#ALS 100	High-Level DOS Driver Routines for MS C & Borland C	**$75**
#ALS 200	DriverLinx™ Windows 95 (32-bit) & Win3.x Drivers	**$149**
#ALS 300	High-Level Drivers for Windows NT (32-bit) Program Development	**$75**
#LVD 100	LabVIEW® 3.x (16-bit) Drivers for HSDAS/LSDAS Boards	**$150**

CyberResearch Assistance: Toll-Free 1-800-341-2525 (USA) ☎ **Tel: 203-483-8815 Fax: 203-483-9024**
Applications Engineers: Mon-Fri, 9 AM-5 PM U.S. Eastern Time • **Internet Website:** http://www.cyberresearch.com • **Fax-on-Demand System:** 203-483-9966 • **BBS:** 203-488-8949

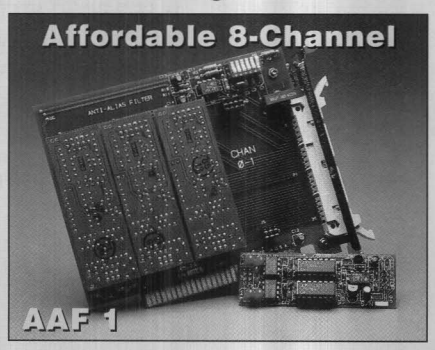
The **AAF 3** is the only plug-in card that provides a choice of 2, 4, 6, or 8 channels of low-pass filtering and/or gain as well as a choice of 2 software-programmable and 5 optional filter types. Such maximum versatility comes from a unique modular board design that allows you to field-install 2-channel filter and gain modules into the main board without factory modification.

AAF 3 boards feature the following capabilities:

- 100% compatibility with top A/D boards.
- **Wide choice of filter characteristics:** Standard, software-selectable 8-pole elliptic and linear phase filters; and optional 8-pole Cauer, Bessel, Butterworth and high-speed linear phase filters. *(Call Fax-on-Demand for detailed specifications.)*
- Sharp attenuation slope of up to 120 dB/octave allows you to move the cutoff frequency much closer to the frequency of undesired signals to be rejected.
- Programmable cutoff frequencies of below 10 Hz to 100 kHz with optional frequencies up to 200 kHz, or even <1 Hz.
- 2 on-board and 2 external cutoff-frequency control sources allow for multiple cutoffs on each card.
- High-quality instrumentation amplifier on each channel. Amplifier provides differential-input and software-selectable, closely-spaced gains of 0.5 to 1000.
- Automatic DC offset compensation eliminates the need for calibration or correction in mose cases.
- Inputs and outputs are on 2 separate connectors, simplifying cable construction to the signal sources and A/D board.

2- to 8-Channel Filter Board Provides Low-Cost Solution Starting at $685

Designed for applications that demand low cost and versatility, our **AAF 1** low-pass filter cards provide two to eight differential analog input channels for your A/D.



Each 2-channel pair is available with any one of five 8-pole filter types with cutoff frequencies ranging from 0.1Hz to 200kHz. The Cauer filter provides rapid attenuation of unwanted frequencies, while only minimally affecting frequencies in the passband.

The AAF 1 operates transparently to your data acquisition board, and **requires no special software to operate,** making it your best choice for a stand-alone solution.

the new **AAF 16** uses the latest in low-noise technology to offer superior specifications that meet the maximum performance needed by high-resolution A/D converters. Complementing this high quality is the companion **PGA 16** board ($2995), which provides a differential amplifier with programmable AC/DC coupling. Supports programmable cutoff frequencies up to 200kHz.

Extensive Software Support for DOS, Windows, LabVIEW®

We've developed both menu-driven programs & drivers that provide the most complete collection of software available with any filter/amplifier card. Each **AAF 3/AAF 16** board includes:

- **Free Drivers for Windows 95/NT, Windows 3.1, & DOS** with example application programs for popular compilers, including Visual Basic, Visual C++, and Borland C++ & Pascal.
- **SETAAF for DOS and WSETAAF for Windows** use a single setup screen with pop-up menus for selecting key parameters. You can save your settings as a description file that can easily be applied to other boards by selecting and loading the file.
- **Drivers for LabVIEW 3 & 4 for Windows, Labtech NOTEBOOK, and DASY*Lab* software included FREE.**

Ordering Information: **Call Fax-on-Demand: 203-483-9966 FOD#3244**

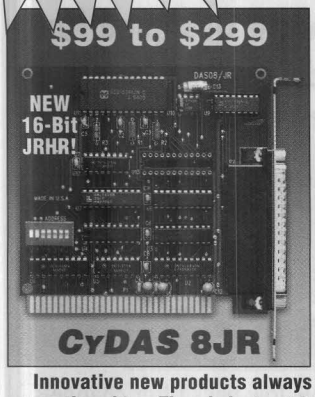
#AAF 3-2	2-Channel Low-Pass Filter Board	**$1095**
#AAF 3-4	4-Channel Low-Pass Filter Board	**$1450**
#AAF 3-8	8-Channel Low-Pass Filter Board	**$2125**
#AAF 3-2G	2-Channel Low-Pass Filter Board w/2 Gain Chan	**$1295**
#AAF 3-4G	4-Channel Low-Pass Filter Board w/4 Gain Chan	**$1850**
#AAF 3-8G	8-Channel Low-Pass Filter Board w/8 Gain Chan	**$2950**
#AAF 1-2	Low-Cost 2-Channel Low-Pass Filter Board	**$685**
#AAF 1-4	Low-Cost 4-Channel Low-Pass Filter Board	**$949**
#AAF 1-8	Low-Cost 8-Channel Low-Pass Filter Board	**$1475**
#AAF 16	16-Channel High-Resolution Low-Pass Filter Bd	**$3995**
#AAF STA	Screw Terminal Panel with large prototyping area for custom circuits for AAF 1 or AAF 3 boards (supports up to 8-channel boards)	**$125**
#AAF 3BNC	BNC Box for connecting signals to inputs of AAF 3 Board	**$195**
#AAF 16BNC	BNC Box w/cable: connect signals to inputs of AAF 16 Bd	**$325**
#AAF 1C-x	Cable: AAF1 to CYDAS **800, 8PG**/AO/801/802, or 14/**1600** Bd	**$130**
#AAF 3CBL-x	Cable:* AAF3 to A/D Board, 1 ft, Specify A/D board (x)	**$115**
#AAF 16CBL-x	Cable:* AAF16 to A/D Board, 1 ft, Specify A/D board (x)	**$175**
#AAF CK-A3	AAF 3 Cabling Kit: High-Density DB-26 – Two Female	**$45**
#AAF CK-A16	AAF 16 Cabling Kit: HD DB-26 – 1 Male & 1 Female	**$45**

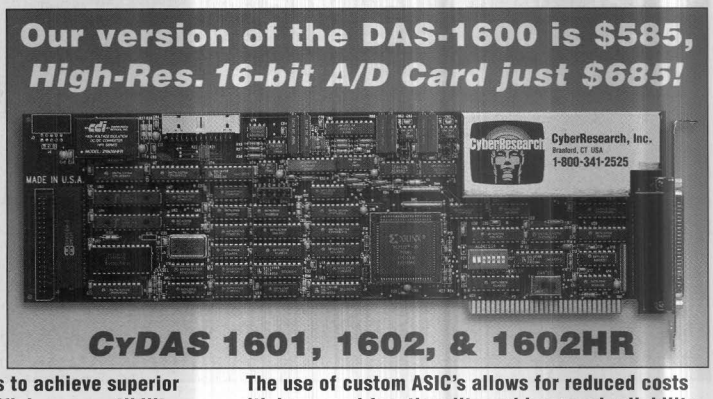
*Special Shielded Cabling carries A/D inputs only – for access to other signals on the same I/O connector, please call for a custom cabling design.

Please call for details on any of these products, or for detailed ordering info. Perfect for use with our **DAP, HS/LSDAS, CYDAS,** & **WIN**-series A/D boards.

Record-Breaking Price/Performance!

CyDAS™: NEW MetraByte Compatibles with DOS & Windows Support, Greater Functionality,





Innovative new products always begin with the same thought... *There's just got to be a better way.*

The *CyDAS* engineering goal was to achieve superior price performance without sacrificing compatibility.

The use of custom ASIC's allows for reduced costs with increased functionality and improved reliability.

Introducing *CyDAS*, a new addition of over 100 different models to our family of MetraByte-compatible data acquisition boards, available exclusively from CyberResearch, the world leader in multi-vendor PC system integration and support.

With *CyDAS*, it is now possible to purchase state-of-the-art, high performance data acquisition boards at unheard-of low prices without having to compromise either MetraByte compatibility or the latest innovative features. **We guarantee both hardware and software compatibility.** All CyberResearch products are backed with our 100% Satisfaction Guarantee or your money back (see inside cover for details). No complications. Just "perfect clones with transparent features"— the ideal replacement for both the old favorites as well as the newest upgraded boards. In addition, as authorized software resellers, we are in the unique position of being able to provide the latest MetraByte-compatible software including Labtech Notebook, SnapMaster, DASY*Lab*, and TestPoint for use with our *CyDAS* boards. We can also supply rack-mounted PCs to complete your system on a turn-key basis.

Over the years, MetraByte-compatible products like the DAS-8 and DAS-16 have come to dominate the data acquisition market as industry standards. They have always been our most popular models, because they are proven designs which include the right features at the right price, with universal software compatibility. They are ideal for both low and high-speed data acquisition applications such as: test and measurement, process control, data logging, signal analysis, energy management, transducer monitoring, lab data collection, and frequency, vibration, & transient analysis.

The new *CyDAS* family includes high-speed analog and digital interface boards for IBM-compatible computers which plug directly into a standard PC expansion slot. Many *CyDAS* boards incorporate advanced ASICs which enable them to **outperform the original MetraByte designs, while maintaining *both* software & accessory compatibility – at much lower prices**. Significant enhancements include faster input rates, improved triggering flexibility, higher accuracy timing, reduced power consumption, and software-programmable unipolar & bipolar input ranges. *CyDAS* boards are compatible with the corresponding MetraByte-compatible accessories such as screw terminal panels, channel expansion, and signal conditioning panels.

The *CyDAS* family of analog and digital I/O boards offers a wide selection of models at every price/performance level. The chart below provides a few comparative examples of *CyDAS* models. In addition, our *CyDAS* analog output and digital I/O boards make it easy to add groups of analog outputs or digital I/O lines as needed. Whatever your MetraByte-compatible requirements, our *CyDAS* line has an equivalent for your consideration. Our products offer superior performance (as much as 3x the speed, with better features,) at considerable savings. Call for FREE application assistance.

The *CyDAS* family of Digital & Analog I/O boards offers a wide choice of models at every price/performance level:

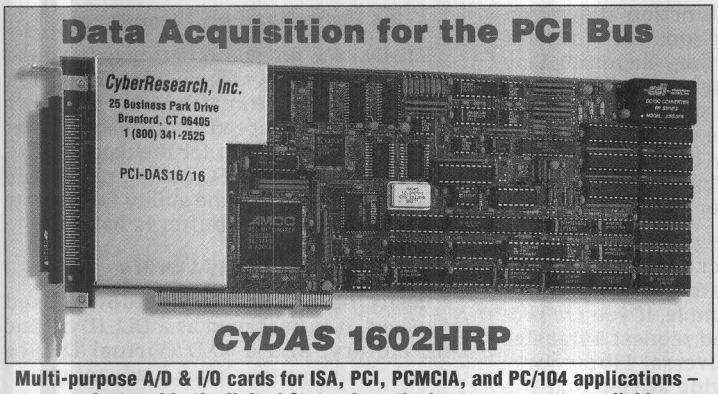
Part Number	#CyDAS	8JR & (JRA0)	8A0	16	800 & (801/2)	1401/2	1601/2	1802ST	1802M1
CyberResearch Price		$99 to $149	$395	$785	$249 (299)	$385	$585	$685	$999
MetraByte Compatible Equivalents		N/A	DAS-8/A0	DAS-16	DAS-800/801/802	DAS-1401/1402	DAS-1601/1602	DAS-1802ST	DAS-58
Typical USA price, 10/1/1996		–	$799	$999	$349/449	$699	$899	$999	$2350
Analog Inputs	Channels	8 Single-Ended	8 SE or Diff	16 SE/8 Diff	8 SE (8 SE or Diff)	16 SE/8 Diff	16 SE/8 Diff	16 SE/8 Diff	8 Diff
	Max. Sample Rate	1 kS/sec	20 kS/sec	50 kS/sec	50 kS/sec	160 kS/sec	160 kS/sec	330 kS/sec	1000 kS/sec (1 MHz)
	Input Ranges:	±5V	±5V, 0-10V	±5V, 0-10V	±5V (±5V, 10V, 0-10V)	±10V, 0-10V	±10V, 0-10V	±5V, ±10V, 0-10V	±5V, ±10V, 0-10V
	Gains Ranges:	Fixed Input	0.5, 1, 2, 4, 8 or 0.5, 1, 5, 10, 100, 500, 1000 or identical to DAS-8/A0	.5, 1, 2, 5, 10	Fixed on CYDAS 800 (1, 10, 100, 1000 or 1, 2, 4, 8 on 801/2)	1, 10, 100,1000 or 1, 2, 4, 8	1, 10, 100, 1000 or 1, 2, 4, 8	1, 2, 4, 8	1, 2, 4, 8
	Gain Select	–	Programmable	Switch Sel.	Fixed (Progr.)	Programmable	Programmable	Programmable	Prog. Gain Queue
	Demand Mode DMA	–	–	–	–	Yes	Yes	REP INSW*	REP INSW*
	Burst Mode	–	–	–	–	Yes	Yes	–	–
Analog Outputs	Channels, Resolution Output Ranges	(2 Ch. on JRA0) (12-bit, ±5V)	2 Ch, 12-bit ±2.5V, ±5, 10V, 0-5, 10V	2 Channels 12-bit, 0-5, ±10V	–	–	2 Channels, 12-bit 0-5,10V; ±5,10V	–	–
Digital I/O	Number of Bits	16 bits	31 bits	32 bits	3 in, 4 out	4 in, 4 out	32 bits	–	32 bits
Counter/Timer	# of Avail. Counters	–	3	3	3	3	3	–	3

*REP INSW is a faster data transfer method than DMA – see the REP INSW Tech Note on page 59. See pages 59 and 63 for our new high-resolution **16-bit A/D boards**. Fax-on-Demand data sheets available – call 203-483-9966. Ask for FOD#**3001**.

See our new 64-Channel A/D board, the CyDAS 6400, on pg. 5B (in the New Products section of this catalog). Board prices include FREE software to install, calibrate and test the board. A $49 Universal Driver Library (CyDAS UDR, pg. 60) is required to provide universal programming language support for all CyDAS boards for all DOS and Windows languages (see pages 60-61 and 76-77 for more software, including LabVIEW drivers). Prices and specifications subject to change without notice. 100% Satisfaction Guaranteed.

CyberResearch Assistance: Toll-Free 1-800-341-2525 (USA) ☎ Tel: 203-483-8815 Fax: 203-483-9024
Applications Engineers: Mon-Fri, 9AM-5PM U.S. Eastern Time • **Internet Website:** http://www.cyberresearch.com • **Fax-on-Demand System:** 203-483-9966 • **BBS:** 203-488-8949

from CyberResearch and Much Lower Prices.



Multi-purpose A/D & I/O cards for ISA, PCI, PCMCIA, and PC/104 applications – manufactured in the United States from the best components available.

Not long ago, our designers hit upon a brilliant idea: Develop *CyDAS*, a new generation of high performance A/D boards with state-of-the-art features that maintain Keithley DAS-16 compatibility at the register level. You could then have the best of both worlds: DAS-16 compatibility (which would allow you to use virtually any 3rd-party software program), and at the same time you'd benefit from newer, better, and faster hardware designs. Plus, thanks to recent advances in manufacturing, **you'd save hundreds of dollars!**

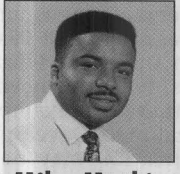
***CyDAS* features:**

- MetraByte-compatibles with all of the latest performance features, at *Much Lower Prices!*
- Broadest selection, with *CyDAS* Replacements for the latest MetraByte series: DAS-8/16, 800, 1200/1400/1600, & 1800
- Hardware compatibility, including cables & accessories
- Software compatibility (register compatible designs)
- 100% Satisfaction Guaranteed or your money back
- Free upgrade from MetraByte ASO to the **CyDAS UDR** Library
- Free installation & test when purchased with a rack-mount PC
- Free technical support both before *and* after the sale
- Same-day shipment on orders from stock received by 2 PM EST

CyDAS boards are **manufactured in the USA**. This flexible product line is ***in stock now***, available for immediate delivery.

Call for PCMCIA or PC/104 — Many models available which can ship in 24 hours.

Tech Notes



Mike Mathis

The Story of REP INSW

64K Barrier Falls • New REPINSW Technology Breaks the DMA Bottleneck

REP INSW (Repeat Input String) is a 286/386/486-class CPU instruction which allows the PC to transfer large amounts of data using a single instruction. Employing the same method that LAN and Hard Disk Controllers use, data is transferred at the maximum rate allowed by the PC's data bus. Data transfer rates range from 1.2MegaWords/second to over 2 MWords per second (1 sample every µsecond.)

Note that each Sample is 1 Word in size, so 1 Word = 1 Sample = 2 Bytes of data. 1 MW (MegaWord) is one million words of data. With REP INSW, your data is transferred completely in the background, and no unreasonable demands are placed on the PC's resources. This means that jobs like screen updates need not be suspended while the data is being read. **REP INSW** offers the potential to increase the performance of current DMA-based data acquisition systems by an order of magnitude!

REP INSW is used on most of our CyDAS-series A/D Boards.

Ordering Information: **Index of CyDAS Fax Datasheets: FOD#3001**

#CYDAS 8JR	8-Channel, 12-bit A/D Board, 1 kHz, 16 DI/O	$99
#CYDAS 8JRAO	8-Channel, 12-bit A/D Board, 1 kHz, 16 DI/O, 2 12-bit D/As	$149
#CYDAS 8JRHR	8-Channel, **16-bit** A/D Board, 30 Hz, 16 DI/O	$199
#CYDAS 8JRAOHR	8-Channel, **16-bit** A/D Board, 30 Hz, 16 DI/O, 2 **16-bit** D/As	$299
#CYDAS 8	DAS-8 Compatible, 8-Ch., 12-bit A/D, 20 kHz, 31 Dig. I/O	$185
#CYDAS 8PGM	(DAS-8PGA/G2) same gains as MetraByte 8PGA: 1,10,100,500	$345
#CYDAS 8PGH	(DAS-8PGA) Programmable High Gains: 1, 2, 4, 8	$345
#CYDAS 8PGL	(DAS-8PGA/G2) Programmable Low Gains	$345
#CYDAS 8AOM	DAS-8/AO: *CyDAS* 8PGM w/Two 12-Bit D/A Ch., MetraByte	$395
#CYDAS 8AOH	DAS-8/AO: *CyDAS* 8PGH w/Two 12-Bit D/A Ch., High Gains	$395
#CYDAS 8AOL	DAS-8/AO: *CyDAS* 8PGL w/Two 12-Bit D/A Ch., Low Gains	$395
#CYDAS 16JR	*CyDAS*-16 Comp., 120 kHz A/D Board, Low Gain	$349
#CYDAS 16JRC	*CyDAS*-16 Comp., 120 kHz A/D, w/add'l 5 Counters	$499
#CYDAS 16JRHR	*CyDAS*-16 Compatible **16-bit** A/D Bd, 100 kHz, Low Gain	$449
#CYDAS 16	DAS-16 Comp., 16-Ch., 12-bit, 50 kHz, 32 DI/O, 2 D/As	$785
#CYDAS 16F	DAS-16 Comp., 16-Ch., 12-bit, 100 kHz, 32 DI/O, 2 D/As	$845
#CYDAS 800	DAS-800 Compatible A/D Board, 50 kHz	$249
#CYDAS 801	DAS-801 Compatible A/D Board, 50 kHz, High Gain	$299
#CYDAS 802	DAS-802 Compatible A/D Board, 50 kHz, Low Gain	$299
#CYDAS 802HR	DAS-802 Compatible **16-bit** A/D Bd, 100 kHz, Low Gain	$399
#CYDAS 1401	DAS-1401 Compatible, 160 kHz, High Gain (page 62)	$385
#CYDAS 1402	DAS-1402 Compatible, 160 kHz, Low Gain (page 62)	$385
#CYDAS 1402HR	DAS-1402 Compatible **16-bit** A/D Bd, 100 kHz, Low Gain	$485
#CYDAS 1601	DAS-1601 Compatible, 160 kHz, High Gain (page 62)	$585
#CYDAS 1602	DAS-1602 Compatible, 160 kHz, Low Gain (page 62)	$585
#CYDAS 1602HR	DAS-1602 Compatible **16-bit** A/D Bd, 100 kHz, Low Gain	$685
#CYDAS 1602HRP	PCI-Bus **16-bit** A/D Board, 200 kHz, Low Gain	$1195
#CYDAS 1802ST	16-Channel A/D Board, 333 kHz, Low Gain	$599
#CYDAS 1802M1	16-Channel A/D Board, 1 MHz, Low Gain	$999
#CYDAS 6402	64-Channel A/D Board, 333 kHz, Low Gain (page 6D)	$799
#CYDAS 6402HR	64-Channel A/D Board, 100 kHz, Low Gain (page 6D)	$999
#CYDAC 02	2-Ch. 12-bit Analog Output Bd (DAC-02, 25-pin, pg. 70)	$155
#CYDAC 02HR	2-Channel **16-bit** Analog Output (D/A) Bd. (pg. 70)	$249
#CYDDA 02JR	2-Channel 12-bit Analog Output, 24 Digital I/O, pg. 70	$149
#CYDDA 04JR	4-Channel 12-bit Analog Output, 24 Digital I/O, pg. 70	$199
#CYDDA 06JR	6-Channel 12-bit Analog Output, 24 Digital I/O, pg. 70	$249
#CYDDA 02JRHR	2-Channel **16-bit** Analog Output, 24 Digital I/O (pg. 70)	$249
#CYDDA 04JRHR	4-Channel **16-bit** Analog Output, 24 Digital I/O (pg. 70)	$349
#CYDDA 06JRHR	6-Channel **16-bit** Analog Output, 24 Digital I/O (pg. 70)	$449
#CYDDA 06	6-Channel 12-bit D/A Bd, 24 Dig. I/O (DDA-06, pg. 70)	$345
#CYDDA 06H	6-Channel **16-bit** Analog Output, 24 Digital I/O	$799
#4CYDDA 06	**PC/104:** 6-Chan. 12-bit D/A Module (40-pin)	$399
#4CYDDA 06I	**PC/104:** 6-Chan. 12-bit 4-20mA Current Output	$399
#CYDDA 08	8-Channel 12-bit Voltage Output (DDA-08, page 71)	$499
#CYDDA 08I	8-Channel 12-bit Analog 4-20mA Current Output	$499
#CYDDA 08HR	8-Channel **16-bit** Analog Voltage Output, (page 71)	$799
#CYDDA 16	16-Channel 12-bit Voltage Output (DDA-16, page 71)	$899
#CYDDA 16I	16-Channel 12-bit Analog 4-20mA Current Output	$899
#CYDDA 16HR	16-Channel **16-bit** Analog Voltage Output, (pg. 71)	$1399

HR – Products in our HR family have 16-bit A/D or D/A converters – **16x** the A/D resolution for only a slightly higher price. CyDAS 8JRAOHR has two 16-bit analog outputs with 10µs FS settling time.

Digital I/O: pp. 72-75; GPIB/IEEE-488: pp. 80-81.

QUANTITY DISCOUNTS: 1-4/LIST 5-9/5% 10-24/10% 25-49/15%

Quantities of a Single Item Per Shipment – Call for Details

The price includes FREE software to install, calibrate and test the board. A $49 Universal Driver Library (described on the next page) provides universal programming language support for all *CyDAS* boards for all DOS & Windows languages. Call for more information on any of our products. Our Fax-on-Demand system can provide data sheets 24-hours-a-day: call 203-483-9966 and request the document of your choice. See pages 64 to 67 for screw terminal panels and cables.

MetraByte is a trademark of Keithley Instruments, Inc. LabVIEW® is a registered trademark of National Instruments Corporation. CyDAS and CYRDAS are trademarks of CyberResearch, Inc. All trademarks used herein are the property of their respective holders.

You can write a line of code for an entry-level CYDAS 8 and use the same line of code for our CYDAS 1800 series boards. Just as importantly, the Universal Library is intelligent. It knows about individual boards and their capabilities. If you ask for something that your board cannot do, a warning message supplies the information you need to correct the program.

From **language to language**, the syntax likewise remains constant. The functions and features remain constant thanks to an **intelligent capability parser**. When you want to change programming languages the UDR Library requires no re-learning. Even moving from DOS to Windows can be painless. The Universal Library code moves with you.

Use existing code with different boards

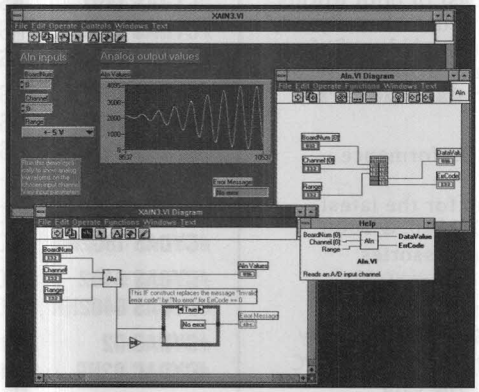
When you want to switch from one board to the next, you do not need to change a line of code. Simply run **InstaCal** (the installer/configuration program provided with all CYDAS-family boards) again to assign your new board to the board number which your program is referencing. InstaCal modifies the configuration file which is read by the standard header file. The Universal Library will then apply only those features which match the capabilities of your new board.

Functions

The Universal Driver Library is built upon individual functions, each of which programs, triggers, reads from, or writes to an I/O component on a board, including:

- Analog I/O Functions
- Digital I/O Functions
- Counter/Timer Functions
- Thermocouple Input Functions
- Error Handling Functions
- Streamer File Functions
- DT-FIFO Memory Buffer Functions

prevent you from writing programs that won't execute, and save you hours of debug time & nights spent puzzling over bad data!



Universal Library includes Complete Support for Windows Languages

Everything you need for DOS, Windows 3.x, or Windows 95 is included in each copy of the Universal Library. You receive the complete installation, calibration and test program, *InstaCal,* DOS language support, *and* Windows language support. Windows NT drivers should be available very soon.

DLL with Linkable Libraries and Virtual Device Driver

The Universal Library for Windows is a DLL with linkable libraries. It can be used with all windows programming languages that support DLLs. This includes (among others) Microsoft C and Visual C++, Visual Basic, Borland C/C++, Watcom C, & Pascal.

A Windows Virtual Device Driver handles interrupt service and other hardware functions. A virtual device driver is the appropriate way for libraries to request and service I/O board and system resources.

your program. Instead it is shared by all programs that call it. This means that each program that uses the library will be smaller than it would be with a standard library.

2) If you need to use a new version of the library released in the future, your executable programs do not have to be re-compiled or re-linked. Just copy the new files.

3) The DLL can be called from any Windows-based language. A DLL has a standard interface which all Windows languages support.

While the Universal Library comes with extensive support for Visual Basic and C (Microsoft or Borland), it can also be called from any other Windows-based language as long as you write an appropriate header file. A new header file can be easily written by modeling it on either the Visual Basic header (CBW.BAS) or the C header file (CBW.H).

The first time a Windows program calls a Universal Library function, the Windows DLL is loaded from disk. The DLL stays loaded in memory while the program runs. If more than one program that used the library is run simultaneously, they both share the DLL, and the DLL stays in memory until the last program that uses it is closed.

Extensive Examples Included

A complete set of example programs for both DOS & Windows programming is included. Examples for Visual Basic, C, & Pascal clarify the use of each Universal Library function. In some cases, functions need to be used in sequence; there are examples which clarify these situations. Developing your own unique application may be as simple as modifying the analog acquire-and-transfer example which is supplied. You can then customize to your own needs by adding the screen design that you require.

Universal Library programs are easy to write and debug. The mnemonic constants come with easy-to-remember names that are then given to numbers that the library uses. These names make the programs easier to write and easier to read. For example, all of the A/D ranges are given names and all of the options are given names. So if you want to select the Unipolar 5-Volt (0 to 5V) A/D range, you can simply set the Range argument = UNI5VOLTS rather than 105.

Ordering Information: **Call Fax-on-Demand for more info: 203-483-9966 FOD#6021**

#CYDAS UDR Universal Driver Library Software (use 1 copy per PC system) **$49**

#CYDAS ULV LabVIEW Extension for the Universal Driver Library **$49**

All software provided on 3.5" diskettes with a detailed user's manual to speed programming efforts.

LabVIEW® and National Instruments® are registered trademarks of National Instruments Corporation.

CyberResearch Assistance: Toll-Free 1-800-341-2525 (USA) Tel: 203-483-8815 Fax: 203-483-9024
Applications Engineers: Mon-Fri, 9AM-5PM U.S. Eastern Time • **Internet Website:** http://www.cyberresearch.com • **Fax-on-Demand System:** 203-483-9966 • **BBS:** 203-488-8949

- Z = (A,Y)Up(BX+C)
- Calibration
  - Y = AY + B
- Complex Numbers (Two Arrays)
  - Addition
  - Subtraction
  - Division
  - Multiplication
  - Rectangular to Polar
- Curve Fit
  - Linear
  - Polynomial
- Derivative
- Digital Windows
  - Blackman
  - Hamming
  - Welch
  - Hanning
  - Bartlett
  - Parzen
  - Rectangular
- Addition
- Subtraction
- Multiplication
- Transpose
- Determinant
- Inverse
- Signal Generation
  - Sine
  - Pulse
  - Triangular
  - Sawtooth
- Smoothing Filters
  - Moving Average & Median
- Statistics
  - Mean
  - Standard Deviation
  - Variance
  - Absolute Deviation

Real-Time Control

- Alarms with 4 setpoints
- PID Loops

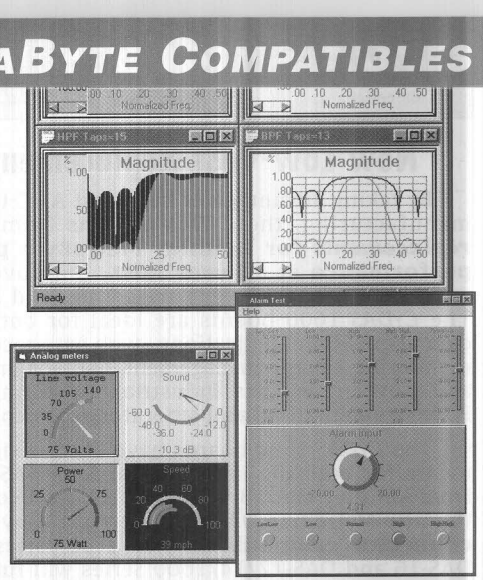
Basic 5.0, C++ 5.0, and JAVA.

GUI Objects

Input controls like circular knobs and sliders allow you to interact and change the value of a variable. Output controls (such as analog meters, bar meters, strip charts, etc.) are used to display the value of a variable in a graphical format that is easier to interpret and use. Any control can be printed, saved as a bitmap, or copied to the clipboard.

Data Analysis & Manipulation Functions

VI Components enables the application developer to perform sophisticated analyses on data being collected. Data analysis is performed in real-time, with minimum overhead. A brief list of the data analysis functions is given at left.



HP VEE: Menu-Driven Software from Hewlett-Packard

HP VEE

"Better Tests Faster"

Visual Programming for Virtual Instrumentation

HP VEE is a powerful visual programming language. To develop programs in HP VEE, you connect graphical "objects" instead of writing lines of code. These programs resemble easy-to-understand block diagrams with lines.

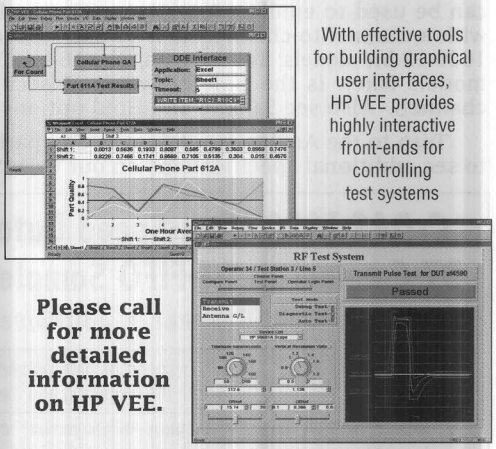
Hewlett-Packard's design creates a productivity paradigm where one HP VEE object accomplishes an entire series of steps in a typical activity (while still allowing low-level "peeks" and "pokes").

As a full language, HP VEE also provides I/O and networking capabilities that iconic GUI builders can't handle, and it helps you develop program logic flow that iconic C code generators don't have.

HP VEE allows you to leverage your existing software written in C/C++, Basic, Pascal, & Fortran, as well as popular database, word processing, and spreadsheet programs.

If your main program is in C/C++, you can call HP VEE programs that would be difficult to write in C/C++ (such as instrument tie-ins), or create your main program in HP VEE and call C/C++ programs.

HP VEE has a wide array of measurement capabilities and it will control most plug-in expansion boards or instruments.



With effective tools for building graphical user interfaces, HP VEE provides highly interactive front-ends for controlling test systems

Please call for more detailed information on HP VEE.

Engineers like the short learning curve of HP VEE – the majority see on-the-job results in the first week!

Ordering Information: **Call Fax-on-Demand for more info: 203-483-9966 FOD#6035**

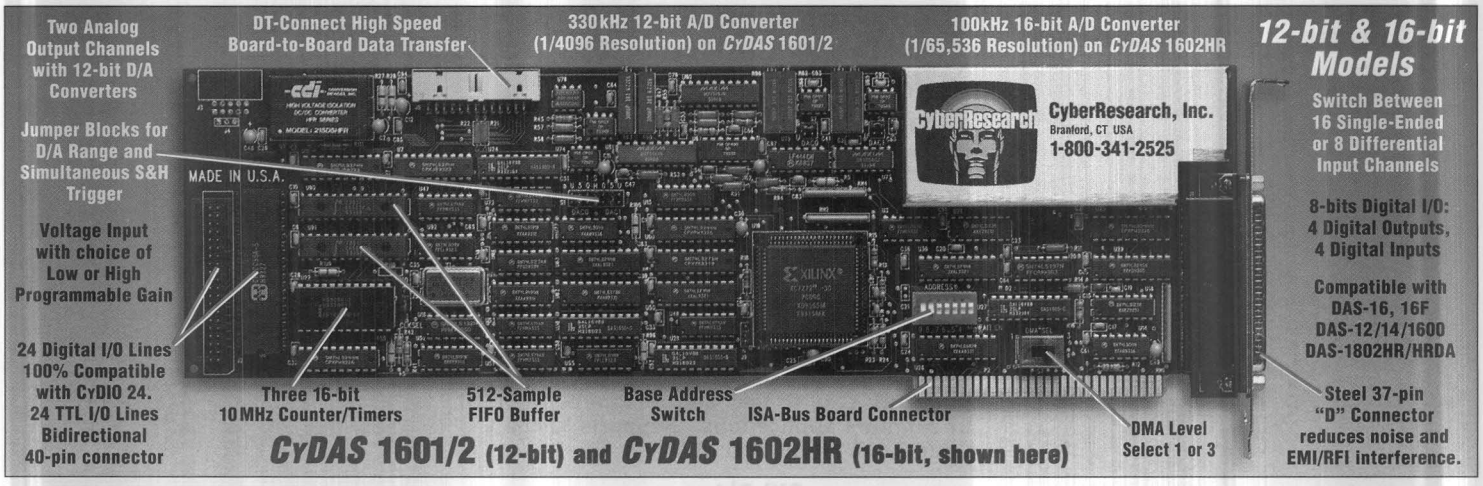
#HPV W95D HP VEE 4.0 Graphical Engineering Software for Win95 & NT, on CD-ROM **$1295**

#HPV W95F HP VEE 4.0 for Win95 & NT, on 3.5" Floppy Diskettes (also includes CD-ROM) **$1395**

#CYDAS VIC VI Components Software Tools for Programmers (see top half of this page) **$249**

VI Components provided on 3.5" diskettes with a detailed user's manual to speed programming efforts.

CyDAS™ 1400 & 1600 MetraByte-Compatibles



New Low-Cost Replacements for MetraByte's DAS-16, 1200, 1400, 1600 & 1800 Series

By taking advantage of the latest ASIC technology and volume manufacturing, the *CyDAS* designs from CyberResearch offer ***replacements*** **for Keithley MetraByte products** with **higher performance** at a **lower cost**. Improvements include faster input rates, more flexible triggering, and more accurate timing. The *CyDAS* 1600 boards are ideal for both low and high-speed data acquisition applications, such as: process control, transducer monitoring, energy management, data logging, frequency, vibration and transient analysis, industrial monitoring, test & measurement, PC instrumentation, and laboratory data collection.

The *CyDAS* 1600 boards have been designed as direct replacements for both the industry-standard DAS-16 Series A/D boards from Keithley MetraByte (total backward compatibility) as well as the new MetraByte DAS-1600 Series. They are **100% register & connector compatible**, so all accessories and software for the DAS-16 and DAS-12/14/1600 Series will run with them (for up to 64 A/D channels on one card, see our **CyDAS 6402** on page 5B).

In many applications, multiple channels of A/D input are multiplexed one at a time into the A/D chip for conversion. The *CyDAS* 1600 includes a **Burst Mode Sampling** capability which can be used to emulate simultaneous sample-and-hold operation with a channel-to-channel skew of only 4µsec on the *CyDAS* 1400/1600 12-bit models; 10µsec using the 16-bit *CyDAS* 1402HR/1602HR models (skew is the time between consecutive samples of each channel). Also see Sample-and-Hold options on page 65.

Turn to the Analog Input Boards Comparison Chart (pp. 44-47) to see additional specifications on our CyDAS-series A/D boards.

CyDAS 1600 High-Speed Data Transfer via DT-Connect to DT-FIFO Sample Buffer Board

250kS/sec Multi-Channel • 330kS/sec Single-Channel

The *CyDAS* 1600 can transfer A/D conversions to the PC via the ISA bus, or to other boards via DT-Connect. DT-Connect is a board-to-board interface standard used by a number of data acquisition, array, and signal processing companies to facilitate high speed data transfer. When used in conjunction with the *CyDAS* DT-FIFO sample buffer board which can hold up to 128 Mega-Samples of memory, DT-Connect can completely free the PC bus from data transfer overhead for ultra-high speed data transfer. Great for Windows. Call for more information.

The speed of data gathering is dependent on the both the triggering and the data transfer method.

A/D Trigger/Transfer Method	*CyDAS* 1601/2	*CyDAS* 1602HR
Interrupt to Variable or Array	20 kS/s	20 kS/s
Direct Memory Access (DMA)	160 kS/s	100 kS/s
DT-Connect, Multi-Channel	250 kS/s	100 kS/s
DT-Connect, Single-Channel	330 kS/s	100 kS/s

The ***CyDAS* 1600 Series** boards feature the following capabilities:

- **12-bit A/D** Converter, for a resolution to 1/4096 parts of full scale. Sustained Sample Rates up to **160k-samples/second. 16-bit** models (*CyDAS* 14/1602HR) resolve 1/65,536 at 100ks/s.
- **16-Channels Single-Ended (SE)** or **8-Channels Differential** expandable to 256 Diff. chan. w/CyEXP 16 multiplexer panels.
- **A/D conversions** can be triggered by: software command, on-board programmable timer, or external trigger pulse. A choice of rising-edge or falling-edge triggering is supported.
- **Data Transfer** can be accomplished by DMA, interrupt service routine, or program control. All modes are software-selectable.
- **32 bits of Digital I/O**: 8 I/O lines on main connector, plus a 24-channel Digital I/O interface (PIO-12 compatible).
- **8254 Counter/Timer** chip has **3 16-bit 10MHz counters.** Counter 0 is available for event counting, pulse generation, and frequency or pulse width measurements. Counter 1 is available to provide external synchronization to the A/D counter or as a programmable rate source.
- **Two 12-bit Analog Outputs (D/A channels)** with jumper-selectable ranges of 0-5V, 0-10V, ±0-5V, ±0-10V. Other ranges are possible with an external reference voltage.
- **Software-Programmable** Input Ranges w/High or Low Gains.
- **Burst Mode** for Simultaneous Sample-and-Hold Emulation.
- **512-Sample FIFO Buffer** allows higher speed A/D.
- **DT-Connect** enables you to transfer data fully independent of the PC bus for ultra-high speed data transfer.
- **Universal Driver Library (CyDAS UDR)** compatibility for great Windows® performance (see page 60).
- **Universal software compatibility**: Supported by a wide range of 3rd-party software & language libraries. Pages 76-77.
- **FREE** easy-to-use **installation, calibration, & test software.**
- **Port your Software Applications** from KM DAS-12/14/1600 and preserve your investment in software and accessories.

The analog input and 8 fixed digital I/O connections are made via a standard 37-pin "D-type" connector at the rear of your computer. An auxiliary 40-pin connector on the board supports connections to the 24 additional bi-directional digital I/O lines. A cable connecting the 40-pin header to a 37-pin connector on a second back-plate is included. These connectors are compatible with all DAS-16 screw terminals, channel expansion multiplexers, digital I/O, and signal conditioning accessories (see pages 64-67).

The CyberResearch 100% Satisfaction Guarantee — See inside cover for details

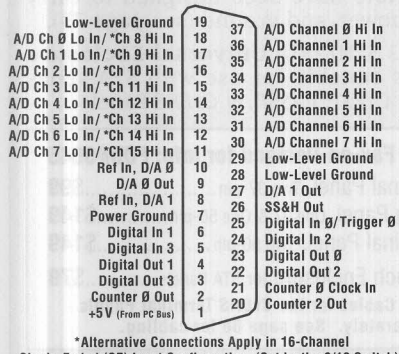
CyberResearch Assistance: Toll-Free 1-800-341-2525 (USA) ☎ Tel: 203-483-8815 Fax: 203-483-9024
Applications Engineers: Mon-Fri, 9AM-5PM U.S. Eastern Time • **Internet Website:** http://www.cyberresearch.com • **Fax-on-Demand System:** 203-483-9966 • **BBS:** 203-488-8949

Performance Comparison: *CyDAS* 16 vs. 1400/1600

Feature: #CYDAS	16/16F	1401/2/HR	1601/2/HR
Price	**$785/845**	**$385/385/585**	**$585/585/785**
Channels 12-bit/16-bit (HR) Res.	16 SE or 8 Diff	16 SE or 8 Diff	16 SE or 8 Diff
Maximum Acquisition Rate	50/100 kS/sec	160/160/100kS/s	160/160/100kS/s
Input Voltage Ranges	Multiple, see pp 44	Multiple, see pp 44	Multiple, see pp 44
Gain Set	Switch-Selectable	Software-Progr.	Software-Programmable
On-Board Memory (w=samples)	1 Word	512 Words	512 Words
Demand Mode DMA/Burst Mode	No	Yes	Yes
On-Board Clock	10 MHz	10 MHz	10 MHz
Initiate Conversions via:	External Interrupt, Software, Timer, or External Trigger	External Interrupt, Software, Timer, or External Trigger	External Interrupt, Software, Timer, or External Trigger
Analog Output, D/A Resolution	2 Channels, 12-Bit	No	2 Channels, 12-Bit
D/A Ranges	0–5V	–	0–5, 10V & ±5, ±10V
Digital I/O (Number of Bits)	8	8	32
Read DAS-16/12,14, or 1600 Code	Yes/No	Yes/Yes	Yes/Yes

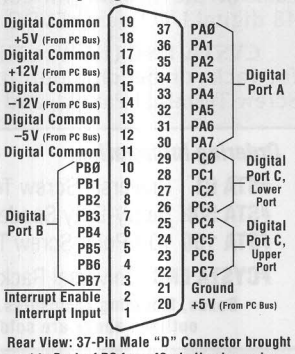
See the charts on pages 44-45 for performance specifications on each board.

CyDAS 1600



*Alternative Connections Apply in 16-Channel Single-Ended (SE) Input Configuration (Set by the 8/16 Switch). Rear View, 37-Pin Male "D-Type" Connector at Back of PC.

CyDAS 1600 Auxiliary Digital I/O Connector



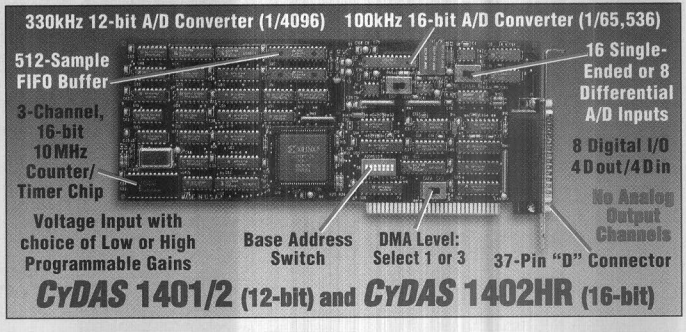
Rear View: 37-Pin Male "D" Connector brought out to Back of PC from 40-pin Header, using optional Auxiliary I/O Adapter Cable #CBL 3740.

Simpler *CyDAS* 1400 for Lower Cost

With the ***CyDAS* 1400 Series** you get **16 channels SE** or 8 channels DIFF for about the same price as an 8 channel board. The CyDAS 1400 is well suited for OEM and other cost-sensitive applications where analog outputs are not required.

***CyDAS* 1401** and ***CyDAS* 1402 A/D** boards feature:

- 16 Channels single-ended or 8 Channels differential, 12-bit A/D, at 160 ks/sec, with Programmable High or Low Gains
- Burst mode (4µS) • 512-Sample FIFO w/block data transfer
- Universal Driver Library/3rd-Party DAS-1600 software
- Register & connector compatible w/CyDAS 16 & 1600
- Smaller size, fewer components, easy to power (+5V only)
- No D/A Analog Output • Only 8 bits DIO: 4 Digital out, 4 in



***CyDAS* 1401/2 (12-bit) and *CyDAS* 1402HR (16-bit)**

CyDAS 1402HR & 1602HR: Hi-Res Versions for 16-bit A/D

With the ***CyDAS* 1402HR** & ***CyDAS* 1602HR** you get a **H**igh **R**esolution **16-bit A/D converter** (resolves to 1/65,536 of full scale) for about the same price as others charge for a board with a 12-bit A/D converter (1 part in 4096 resolution). Because the *CyDAS* 1402HR and *CyDAS* 1602HR are a natural extension of the DAS-16/1400/1600 family architecture, they are fully compatible with the ***Universal Driver Library*** (pg. 60) as well as a wide selection of ***3rd-Party Software***. In addition they are register-compatible with the MetraByte **DAS-HRES,** and our ***CyDAS* 1402** & **1602** including burst mode and gain codes.

***CyDAS* 1402HR** board's unique features:

- 16-bit A/D Converter • 100kS/sec throughput continuous
- No D/A Analog Output • Only 8 bits DIO: 4 Digital out, 4 in
- Smaller size, fewer components, less power (5V from PC).

***CyDAS* 1602HR** board's unique features:

- 16-bit A/D Converter • 100kS/sec throughput continuous
- 2 Channels of 12-bit D/A Analog Output
- 32-bits Digital I/O: 4 dig. out, 4 dig. in, & 24 bi-directional
- High speed DT-Connect data transfers to DT-FIFO board

Input Voltage Ranges / Throughput

Model #CYDAS 1401 160 kS/s
Model #CYDAS 1601 160 kS/s

Note: High-gain versions of the 16-bit *CyDAS* 1400HR and 1600HR do not exist.

Software-Programmable ***High Gain***

GAIN	UNIPOLAR	BIPOLAR
1	0 to 10V	±10V
10	0 to 1V	±1V
100	0 to 100mV	±100mV
1000	0 to 10mV	±10mV

Model #CYDAS 1402 160 kS/s
Model #CYDAS 1602 160 kS/s
Model #CYDAS 1402HR 100 kS/s
Model #CYDAS 1602HR 100 kS/s

Software-Programmable ***Low Gain***

GAIN	UNIPOLAR	BIPOLAR
1	0 to 10V	±10V
2	0 to 5V	±5V
4	0 to 2.5V	±2.5V
8	0 to 1.25V	±1.25V

Digital I/O*: 8 I/O lines on main 37-Pin connector, fixed 4 Outputs & 4 Inputs. Interrupts capability & 24 more bits of bidirectional I/O on Auxiliary Connector.

Analog Output*: 2 Channels, 12-bit Resolution, Switch-Selectable Voltage Ranges: 0-5V, 0-10V, ±5V, ±10V. Other ranges possible with external reference. Maximum current output: ±5mA, Settling Time: 4µs to 0.01%, Linearity: ±1-bit, Output impedance: <0.1Ω. On-board reference voltage: –5.00V, ±50mV.

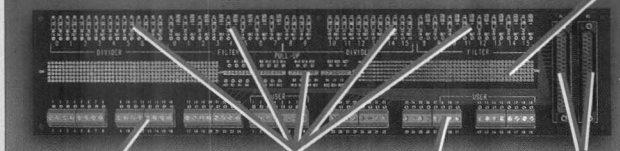
***Analog Output & 32-bit Digital I/O not available on the *CyDAS* 1401, 1402, or 1402HR.**

Ordering Information: Index of CyDAS Fax Datasheets: FOD#3001

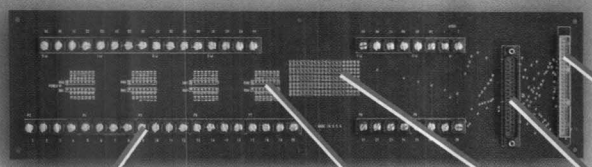
#CYDAS 1401 DAS-1401 Compatible A/D Board, 160 kHz, High Gain...**$385**
#CYDAS 1402 DAS-1402 Compatible A/D Board, 160 kHz, Low Gain...**$385**
#CYDAS 1402HR DAS-1402 Compatible **16-bit** A/D Bd, 100 kHz, Low Gain **$585**
#CYDAS 1601 DAS-1601 Compatible A/D Board, 160 kHz, High Gain...**$585**
#CYDAS 1602 DAS-1602 Compatible A/D Board, 160 kHz, Low Gain...**$585**
#CYDAS 1602HR DAS-1602 Compatible **16-bit** A/D Bd, 100 kHz, Low Gain **$785**
#STA 01 Universal Screw Terminal Panel, Two 37-pin D-Connectors..**$99**
#CYSTP 37 37-pin Mini Terminal Panel, No Box, pg. 64 (cable required)...**$59**
#CYSTP 37A 37-pin Mini Terminal Panel, w/Box, pg. 64 (cable req'd).....**$69**
#CYEXP 16 16-Channel Multiplexing Terminal Panel.....**$249**
#CYEXP 32 32-Channel Multiplexing Terminal Panel.....**$349**
#CBL MX10 10-foot Cable: required from DAS 14/1600 to 1st CYEXP Panel....**$49**
#CYSSH 04 4-Ch. Simultaneous Sampling Pnl, pg. 65 (cable req'd)....**$399**
#CYSSH 08 8-Ch. Simultaneous Sampling Pnl, pg. 65 (cable req'd)....**$549**
#CYSSH 16 16-Ch. Simultaneous Sampling Pnl, pg. 65 (cable req'd)..**$899**
#CYERB 08 8-Ch. Relay Panel, 5A@120VAC or 6A@28VDC, pg. 75.....**$107**
#CYERB 24 24-Ch. Relay Panel, 5A@120VAC or 6A@28VDC, pg. 75.....**$197**
#CYSSR 08 8-Ch. Buffered Solid State Relay Mtg. Panel, pg. 75.....**$95**
#CYSSR 24 24-Ch. Buffered Solid State Relay Mtg. Panel, pg. 75...**$149**
#CBL 3740 Brings Internal 40-pin Header out to 37-pin 'D' Connector.....**$25**
#CBL 3702 2-Foot Flat Ribbon Cable, F-F, 37-pin to 37-pin 'D' Connectors...**$25**
#CBL 3705 5-Foot Round Shielded Cable, F-F, 37-pin 'D' Connectors.....**$39**
#CBL 3710 10-Foot Round Shielded Cable, F-F, 37-pin 'D' Connectors.....**$49**
#CYDAS UDR Universal Driver Library (see page 60).....**$49**
#CYDAS ULV LabVIEW® Upgrade for Universal Driver Library (page 60)...**$49**

The price includes FREE software to install, calibrate and test the board. A $49 Universal Driver Library (see page 60) provides universal programming language support for all *CyDAS* boards for all DOS and Windows languages. See pages 64 to 67 for terminal panels & cables.

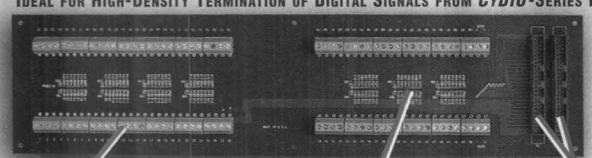
STA 01 General-Purpose Screw Terminal Panel (37-pin only)



STA 50H Heavy-Duty 50-Point Spade Lug Terminal Panel (50 or 37-pin)



STA 100 General-Purpose 100-Point Screw Terminal Panel (50-pin only)
Ideal for High-Density Termination of Digital Signals from *CyDIO*-Series Boards



CyDAS Universal Screw Terminal Panels require the appropriate cable to connect them to cards in your PC. See page 66 for our *CyDAS* Cables.

Universal Screw Terminal Panels for Field Wiring

We recognize that terminal panels are one of a system's most important components. Our **STA-series Screw Terminal Panels** were designed with careful attention to detail – they are ideal for use with any I/O board that has 37 or 50-pin signal connectors.

Our **STA 01** (16" x 3.5") features miniature screw terminals which accept #12 to #22 AWG wires for easy signal termination. The panel's large size includes a generous prototyping area (with holes on 0.1" centers), as well as room for circuitry for voltage-dividers, low-pass filters, and pull-up resistors. These extra circuits are frequently used to condition signals, and can be populated as needed by the user with the right components for your application. Circuitry & component selection is fully explained in the I/O board manual.

STA 50H (16"x4") features rugged spade lug terminals. Spade lugs (avail. at Radio Shack, auto parts, & hardware suppliers) may be crimped onto each signal wire for easy connection of wiring to the terminals.

Our **STA 100** (16" x 4") has been specifically designed for high-density termination of digital signals from our 48, 96, & 192-line digital I/O boards. Locations for pull-up resistors are included. Each of the two 50-pin connectors have been designed to carry 48 digital I/O lines, +5VDC PC power, and ground (see page 73).

CYSTA ENC (19"W x 7"D x 3.5"H/2RU) **Universal Enclosure** for rack- or bench-mounting is suitable for use with STA-series Screw Terminal Panels, and our *CyEXP, CySSR,* & *CyERB* Panels.

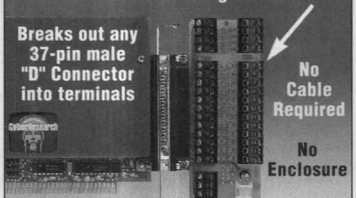
Ordering Information: **Call Fax-on-Demand for info: FOD#3045**

#**STA 01**	Universal Screw Terminal Panel, Two 37-pin	$99
#**STA 50H**	Heavy-Duty Spade Lug Panel, One 37 & One 50-pin	$149
#**STA 100**	100-Point Screw Terminal Panel, Two 50-pin	$149
#**CYSTA ENC**	Universal Rack/Bench Enclosure for STA Panels	$79

Boxes, Mounting Enclosures, and Cables for the *CyDAS* Terminal Panels outlined above are sold separately. See page 66 for cabling.

CYSTP 37 & 37A
37-pin Mini Screw Terminal Panel

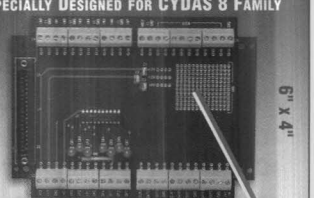
CYSTC 37 Plug-On Terminal



37-pin Direct Plug-on Terminal Panel – Easy connect/disconnect of field wiring.

CYSTP 50 & 50A
50-pin Mini Screw Terminal Panel

CYSTA 08PG Terminal Panel
Specially Designed for CYDAS 8 Family



Miniature Screw Terminal Panels

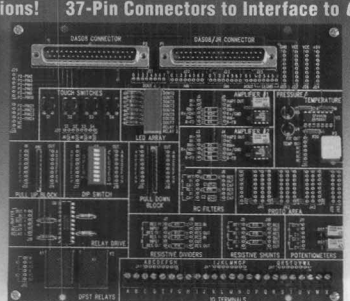
Our *"CySTP"* Terminal Panels are ideal for tight places and tight budgets — yet they maintain 100% compatibility with (and can be used with) all industry-standard 37-pin or 50-pin boards (see the Configuration Guide on pg 67; cables are on page 66).

The **CySTP 37** & **50** are low-cost 37 & 50-pin mini-size terminal panels (only 4" x 4"). No enclosure included, 37 or 50-pin cable required. A small prototype area on the CySTP 37 facilitates the construction of user circuits such as filters, amplifiers, & attenuators.

Solderless Connections! **37-Pin Connectors to Interface to *CyDAS* 8, 8JR, or 8JRAO**

The CyDAS LTERM is a deluxe experimenter's terminal panel with enclosure. It's been designed specifically to facilitate lab use of our CyDAS 8, 8JR, & 8JRAO boards.

A 37-pin cable (such as the 2-ft. CBL 3702, the 5-ft. CBL 3705, or equiv.) is required (pg 66).



Circuits on Board for:
- Op-Amps
- Voltage Dividers
- Strain Gauge from FIT
- Pull Up / Pull Down Resistors
- LED Display
- Electromech. Relays
- Momentary Contact Switches
- Screw Terminals and Sockets for All Connections

CyDAS LTERM (Call for info on *CyDAS* 8JR)

The **CYSTP 37A** is the same as the *CySTP* 37 (at left), but it **includes a compact plastic enclosure.** 37-pin cable required.

The **CYSTC 37** Direct Plug-on Screw Terminal Panel – for wiring to boards w/37-pin male "D" conn. *No box or cable req'd.*

The **CYSTP 50** is a new low-cost 50-pin mini-size terminal panel (just 4"x4"). No enclosure included, 50-pin cable req'd.

The **CYSTP 50A** is the same as above (the *CySTP* 50), but it **includes a compact plastic enclosure.** 50-pin cable required.

The **CYSTA 08PG** is a special-purpose mini-size screw terminal panel (only 6" x 4"). It has a small prototyping area, and LEDs monitor digital I/O status. No enclosure, 37-pin cable required.

A 37 or 50-pin cable is required to connect your DAS board to the terminal panel. See page 66.

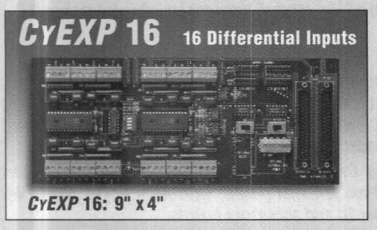
Ordering Information:

#**CYSTP 37**	37-Pin Mini Terminal Panel, No Box (cable required)	$59
#**CYSTP 37A**	37-Pin Mini Terminal Panel, w/Box (cable required)	$69
#**CYSTC 37**	37-Pin Direct Plug-on Terminal Pnl, (no box, no cable req'd)	$109
#**CYSTP 50**	50-Pin Mini Terminal Panel, No Box (cable required)	$59
#**CYSTP 50A**	50-Pin Mini Terminal Panel, w/Box (cable required)	$69
#**INST 339**	37-Pin Screw Terminal Block, DIN Rail Mtng (w/6' Cable)	$89
#**CYSTA 08PG**	CyDAS 8-Series Terminal Panel w/LEDs (cable req'd)	$79
#**CYDAS LTERM**	Experimenter's Term. Panel w/enclosure (cable req'd)	$198

CyberResearch Assistance: Toll-Free 1-800-341-2525 (USA) Tel: 203-483-8815 Fax: 203-483-9024
Applications Engineers: Mon-Fri, 9 AM-5 PM U.S. Eastern Time • **Internet Website:** http://www.cyberresearch.com • **Fax-on-Demand System:** 203-483-9966 • **BBS:** 203-488-8949

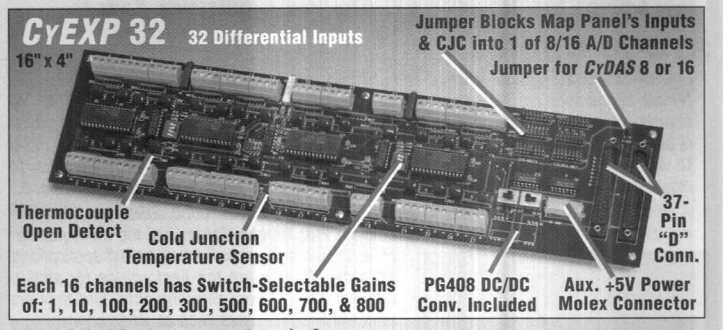
CyEXP 16 & 32

16 & 32-Channel Analog Input Multiplexer & Thermocouple Conditioning Panels



Our ***CyEXP* 16 & *CyEXP* 32** Analog Input Multiplexer & Thermocouple Conditioning Panels are designed for use with our *CyDAS/CYRDAS* families of MetraByte-compatible DAS boards. Each **CyEXP 16** panel turns one single-ended input channel from your A/D board into 16 differential input channels. Our ***CyEXP* 32** panel is two *CyEXP* 16s on one panel, multiplexing 32 differential input channels into two single-ended A/D channels on your DAS board.

You can cascade additional *CyEXP* panels to configure a system with **up to 256 channels.** Switch-selectable gain control (per 16 channels) allows you to connect a variety of signals, including: voltage, current, or thermocouples — with on-board cold junction compensation, open TC detection, and low-pass filtering for each channel. (The passive components which provide these features may be included by closing a small solder-bridge pad.) Each 16-channel multiplexer is controlled by 4 digital I/O lines from your *CyDAS* 8, 16, or other A/D board. Our *CyEXP* panels are compatible with a wide variety of third-party software packages.



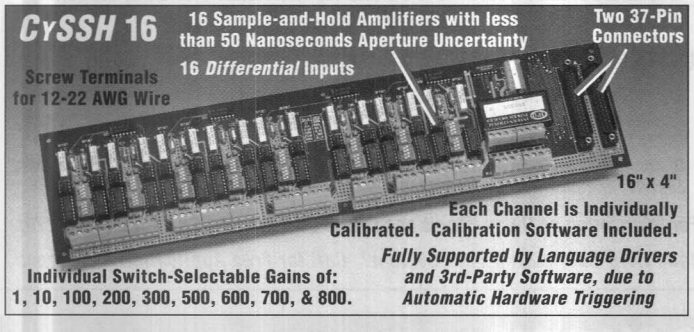
***EXP* 16 & 32** Accessory Panels feature:

- **16 (*CyEXP* 16) or 32 (*CyEXP* 32) Differential Inputs**
- **Type J, K, T, E, S, & R Thermocouple Inputs**
- **Open Thermocouple Detect • Optional Low-Pass Filter**
- **Gains of: 1, 10, 100, 200, 300, 500, 600, 700, & 800**
- **Cascade up to 128 inputs or 112 Thermocouples to *CyDAS* 8 Family**
- **Cascade up to 256 inputs or 240 Thermocouples to *CyDAS* 16 Family**

***NEW!! CyEXP* GP/RTD/BRG** 8 or 16-Channel Multiplexers with a choice of RTD and/or Bridge Completion Signal Conditioning. Call our FAX-on-Demand for Details, 203-483-9966, **FOD#3532.**

CySSH 04, 08, & 16

4, 8, & 16-Channel Simultaneous Sample & Hold Panels



The ***CySSH 04, 08, & 16*** provides for the simultaneous sampling of 4, 8, or 16 channels, eliminating the channel-to-channel skew associated with multiplexed A/D inputs. Choose 4, 8, or 16 differential amplifiers with individually switch-selectable gains to provide flexible amplification of individual signals without a loss of throughput, even at high gain settings. Each channel can be calibrated for the range you want to gather data in. After amplification, each channel has a sample-and-hold which is controlled by your analog input board. The total aperture uncertainty for all 16 circuits is less than 50 nanoseconds.

CySTA 5B08 & 5B16

8 & 16-Channel Signal Conditioning Module Mounting Panels

The ***CySTA* 5B08** & **5B16** are mounting panels which hold 8 or 16 "5B-series" signal conditioning modules. Signals are routed through the 5Bs to a 37-pin connector for use by any DAS board. 5B modules convert hard-to-interface signals into 5V-range signals readable by A/D boards. 5B Modules are available for Thermocouple, Linearized TC & RTD, Voltage, Strain Gauge, Frequency, and Current Input; plus Current Output. For 5B-series modules, see full-size *PC Systems Handbook*.

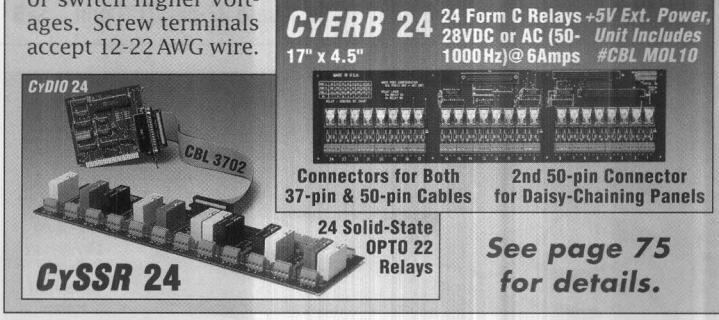
See page 66 for cabling.

CyERB 08 & 24 and CySSR 24

8 & 24-Channel Relay Accessory Panels

The ***CyERB* 08** (9" x 4") has 8 SPDT/Form C relays and two 37-pin connectors. (The second 37-pin connector is for pass-through of signals to other accessories.) The ***CyERB* 24** (17" x 4.5") has 24 SPDT/Form C relays, with one 37-pin & two 50-pin connectors. These 3-post electromechanical relays are rated for 28 VDC@6 Amps/120VAC@5A. See page 75 for details.

The ***CySSR 08*** has space for mounting 8 OPTO-22 relays. The ***CySSR 24*** has space for mounting 24 OPTO-22 relays. Solid-state relays isolate you from AC or DC power, making it easy to sense or switch higher voltages. Screw terminals accept 12-22 AWG wire.



See page 75 for details.

Ordering Information:	Call Fax-on-Demand for info: FOD#3045	
#CYEXP 16	16-Channel Multiplexing Terminal Panel	$249
#CYEXP 32	32-Channel Multiplexing Terminal Panel	$349
#CYEXP GP	8-Ch. Multiplexing Terminal Panel w/RTD & Bridge Signal Cond	$599
#CYEXP RTD	16-Ch. Multiplexing Terminal Panel w/RTD Signal Conditioning	$699
#CYEXP BRG	16-Ch. Multiplexing Panel w/Bridge Completion Signal Cond	$799
#CBL MX10	10' Cable: required from DAS 16 to 1st CYEXP Panel or STA 5B08	$49
#CYERB 08	8-Channel Relay Panel, 5A@120VAC or 6A@28VDC	$107
#CYERB 24	24-Channel Relay Panel, 5A@120VAC or 6A@28VDC	$197
#CYSSR 08	8-Ch. Buffered Solid State Relay Mtg. Panel	$95
#CYSSR 24	24-Ch. Buffered Solid State Relay Mtg. Panel	$149
#CYSSH 04	4-Channel Simultaneous Sampling Panel	$399
#CYSSH 08	8-Channel Simultaneous Sampling Panel	$549
#CYSSH 16	16-Channel Simultaneous Sampling Panel	$859
#CYSTA 5B08	8-Ch. Signal Conditioning Module Mounting Panel	$149
#CYSTA 5B16	16-Ch. Signal Conditioning Module Mtg Panel	$199

Cables are not included with the above panels. See pages 66 & 67.

Ordering Information: **Fax-on-Demand: Accessories FOD#3045**

Cables for use with *CyDAS* Data Acquisition Boards

37-Pin Cables:

CyDAS cables are almost always equipped with female connectors at each end. The female connectors are intended to mate with the male connectors found on CyDAS I/O boards, screw terminal panels, and signal conditioning accessories. The male connector is always mounted on the board because, of the two, the female connector is more likely to wear out as a result of frequent insertions and removals. A tight fit is essential to maintain good signal quality and it's more economical to replace a cable than a board.

A choice of both flat ribbon cables with IDC Connectors and round shielded cables with molded connectors are available. Economical ***Flat Ribbon Cables*** *are the most popular cable choice and are suitable for most applications.* ***Shielded Cables*** *are the best choice for analog connections in noisy environments, and they are required in some cases such as when connecting a CySSH16 to a CyDAS 16.*

Most CyDAS A/D boards, along with their mating accessory panels and screw terminal panels, have male 37-pin "D" connectors. CyDAS cables with two 37-pin female "D" connectors are used to connect between a screw terminal or accessory panel with a male 37-pin "D-type" connector, and a male 37-pin "D" connector on a CyDAS board (located at the back of the PC). See the Configuration Guide on page 47.

37-pin cables are used to connect 37-pin terminal panels & accessory boards to the ***CyDAS 8, 8PGH/M/L, 8AOH/M/L, 8JR, 8JRAO, 16, 16F, 16JR/JRC, 800, 801/2, 1401/2/HR, 1601/2/HR, 1802M1/ST;*** *and the* ***CyDIO 24/24H/24C, CyDDA 06/06H/08/08i/16/16i, CyPDISO 8, CyPDMA 16,*** *and* ***CyCTM 05/10.***

The CBL 3705 & CBL 3710 cables may be used in place of the CBL 3702.

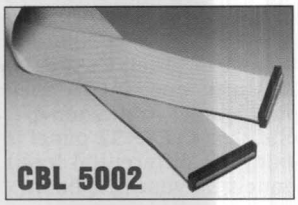
#**CBL 3702**	37-pin 24" Flat Ribbon Cable (Replaces MetraByte's **C-1800**)	$25
#**CBL 3705**	37-pin 5-Foot Shielded Cable	$39
#**CBL 3710**	37-pin 10-Foot Shielded Cable	$49
#**CBL MX10**	37-pin 10-Ft Special Shielded Cable (Req'd w/some accessories)	$49
#**CBL MOL10**	10-Ft Power PC Power Supply Cable (Required w/some accessories)	$15
#**CBL MOL3**	PC Power "Y" Splitter Cable for use w/CBL MOL10	$15
#**CBL 3700**	Brings Internal 37-Pin I/O Port out to Rear of PC	$25
#**CBL 3740**	Brings Internal 40-Pin Header out to 37-pin "D" Conn	$25
#**CBL 3750**	Brings Internal 50-Pin Header out to 37-pin "D" Conn	$25

The Number of Pins & Type of Connector is listed on each Board's Data Sheet.

Custom Flat Ribbon Cable Lengths are Available **Special Order Only.**

50-Pin Cable:

CyDAS high-density digital I/O boards and the CyDAS 48 A/D board require 50-conductor cables. These cables are terminated with 50-pin header connectors (IDC) which mate with standard header connectors. (0.1" centers)



Our CyDAS 50-pin cables are also used to connect 50-pin terminal panels, expansion boxes, digital I/O boards, and accessory boards.

The following boards require 50-pin cables: ***CyDAS 48, CyDI 48/96/192, CyDO 24HV/48HV, CyDO 48H/96H/192H, CyDIO 48/48H/96/192, CyISO 48, CyINT 32, CyDUAL AC5, CyPDISO 16, CyREL 16,*** *and* ***CyCTM 10H/10HX/20H/20HX.*** *In addition the following accessory boards will accept 50-pin cable connectors:* ***STA 50H, STA 100, CySTP 50 & 50A, CySSR 24,*** *and* ***CyERB 24 & 48.***

#**CBL 5002**	50-pin 24" Flat Ribbon Cable (50-pin header to 50-pin header)	$25
#**CBL 5006**	50-pin 6-Foot Flat Ribbon Cable (header to header)	$35

#**CYEXP 16 & 32** Multiplexer & Thermocouple Conditioning Accessory Panel Cabling: (see pages 65 and 67)

To connect a ***CyEXP 16, 32,*** *or* ***GP*** *to a* ***CyDAS 8, 8PGM/H/L,*** *or* ***8AO,*** *use a* ***CBL 3702*** *cable.*

To connect a ***CyEXP 16, 32,*** *or* ***GP*** *to a* ***CyDAS 16, 16F, 16JRC, 1401/2/HR, 1601/2/HR, 1802M1, 1802ST,*** *or* ***1802STi,*** *use a* ***CBL MX10*** *cable.*

To daisy-chain from a ***CyEXP 16, 32,*** *or* ***GP*** *to a* ***CyEXP 16, 32,*** *or* ***GP,*** *use a* ***CBL 3702*** *cable. (CyDAS 8 family up to 128 Channels/system, CyDAS 16 up to 256 Channels.)*

#**CYSSH 04, 08, & 16** Simultaneous Sample & Hold Panel Cabling: (see pg. 65)

To connect a ***CySSH 04, 08,*** *or* ***16*** *to a* ***CyDAS 16, 16F, 16JRC, 1401/2/HR, 1601/2/HR, 1802M1, 1802ST,*** *or* ***1802STi,*** *use a* ***CBL 3705*** *or* ***3710*** *shielded cable.*

#**CYSTA 5B08 & 16** Signal Conditioning Module Mtg. Panel Cabling: (pg. 65)

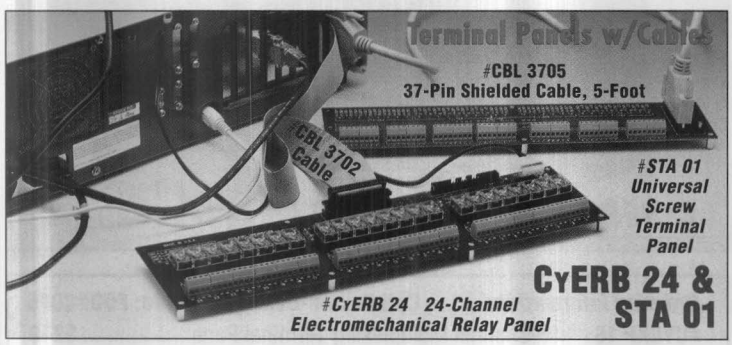
To connect a ***CySTA 5B08*** *to a* ***CyDAS 8, 8PGH/M/L, 8AO,*** *or* ***CyEXP xx*** *use a* ***CBL 3702*** *cable.*

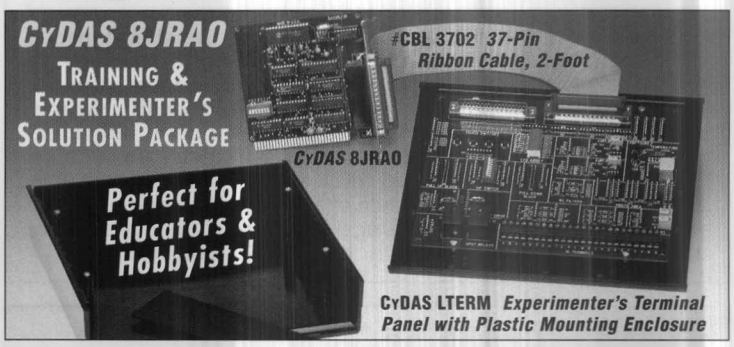
To connect a ***CySTA 5B08*** *to a* ***CyDAS 16, 16F, 16JRC, 1401/2/HR, 1601/2/HR, 1802M1, 1802ST,*** *or* ***1802STi,*** *use a* ***CBL MX10*** *cable.*

To connect a ***CySTA 5B16*** *to a* ***CyDAS 16, 16F, 16JRC, 1401/2/HR, 1601/2/HR, 1802M1, 1802ST,*** *or* ***1802STi,*** *use a* ***CBL 3702*** *cable.*

For Information on Relay Panels see CyERB 08 & 24 / CySSR 08 & 24 (page 75).

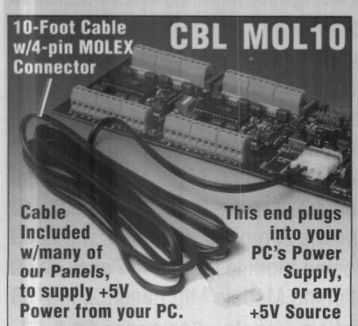
Need Help Configuring Your System? Call for Free Application Assistance.





Auxiliary Power Cable

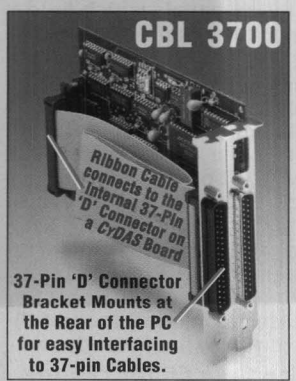
Provides additional +5V Power for Accessory Panels



Some accessory panels require more +5V power than can be carried in a strand of ribbon cable. For those boards we now have a heavier cable with 4-pin Molex connectors. This 10-foot cable brings +5V power from any accessory power connector on the power supply inside your PC out to an external panel. The **CBL MOL10** cable is included with our *CyERB 08/24/48, CySSH 04/08/16, CySSR 24,* and the *CySTA 5B08 & 5B16* panels.

CBL 3700, 3740, & 3750 Simplify Cabling

37, 40, or 50-pin Internal Port to D-Connector/Bracket Assembly

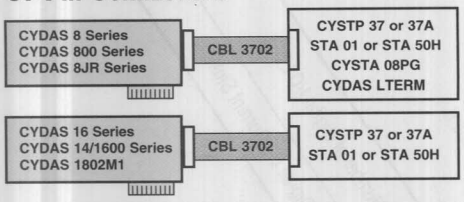


The ***CBL 3700, 3740,*** & **3750** bring the internal port built onto many ***CyDAS*** A/D boards out to the rear of the PC. The ***CBL 3700*** brings the internal 37-pin port to a 37-pin rear connector-with-bracket. It is used with the ***CyDAS 8, 16, 16F, 16JRC, & CyCTM 10.*** The **CBL 3740** converts a 40-pin header to a 37-pin rear connector, and is used with the ***CyDAS 8AO, 1601/2/HR, & 1802M1.*** The **CBL 3750** brings the ***CyPDISO 16***'s 50-pin header out to a 37-pin "D".

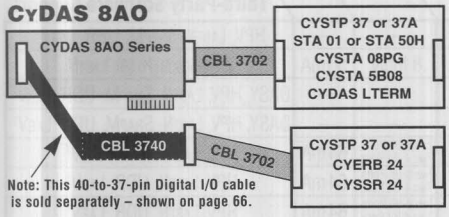
CyberResearch Assistance: Toll-Free 1-800-341-2525 (USA) ☎ Tel: 203-483-8815 Fax: 203-483-9024
Applications Engineers: Mon-Fri, 9AM-5PM U.S. Eastern Time • **Internet Website:** http://www.cyberresearch.com • **Fax-on-Demand System:** 203-483-9966 • **BBS:** 203-488-8949

Examples: Common Ways to Configure Systems with CyberResearch Cables, Terminal Panels, & Accessories

37-Pin Connectors



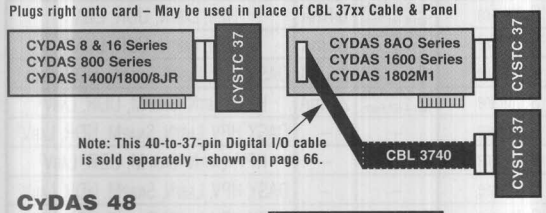
CyDAS 8AO



Note: This 40-to-37-pin Digital I/O cable is sold separately – shown on page 66.

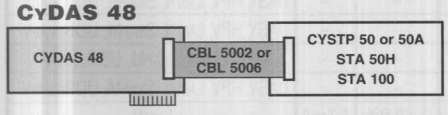
Direct Plug-On Screw Terminal: CySTC 37

Plugs right onto card – May be used in place of CBL 37xx Cable & Panel

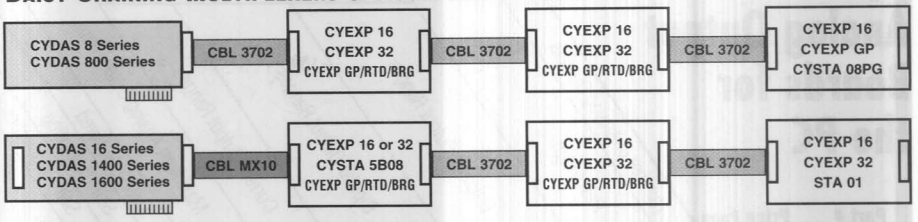


Note: This 40-to-37-pin Digital I/O cable is sold separately – shown on page 66.

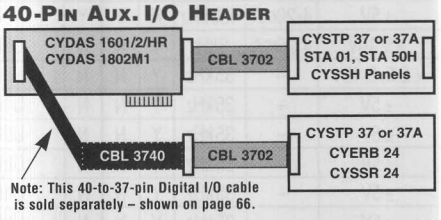
CyDAS 48



Daisy-Chaining Multiplexers & Accessory Panels



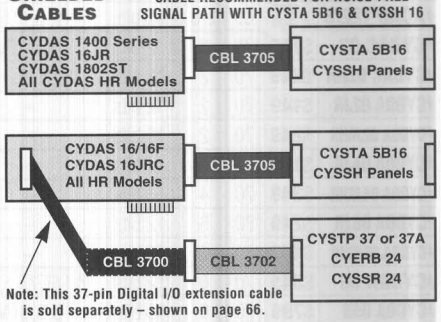
40-Pin Aux. I/O Header



Note: This 40-to-37-pin Digital I/O cable is sold separately – shown on page 66.

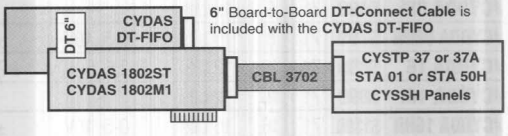
Shielded Cables

CBL 3705 OR CBL 3710 SHIELDED CABLE RECOMMENDED FOR NOISE-FREE SIGNAL PATH WITH CYSTA 5B16 & CYSSH 16



Note: This 37-pin Digital I/O extension cable is sold separately – shown on page 66.

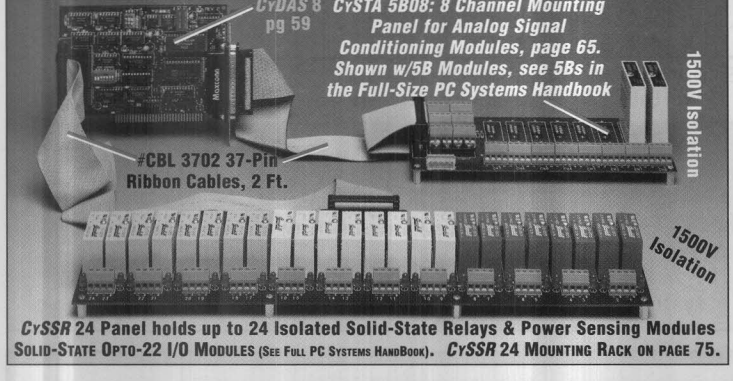
Still Confused?
Just call our toll-free Applications Hotline:
1-800-341-2525
We can help you pick the right products for your application.



6" Board-to-Board **DT-Connect Cable** is included with the **CYDAS DT-FIFO**

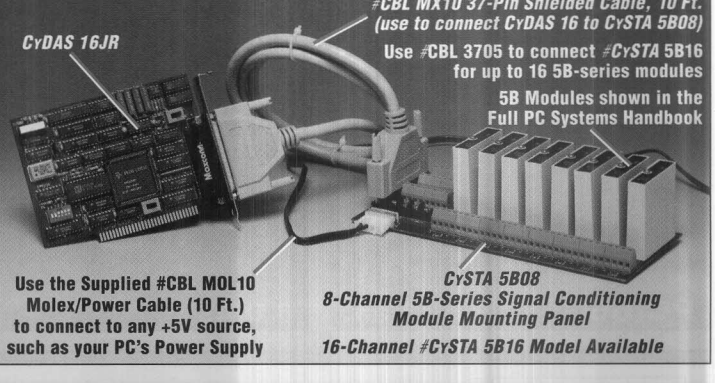
Any #CBL 3702 Ribbon Cable shown above may be replaced by the #CBL 3705 or #CBL 3710 Round Shielded 37-pin Cables, which are recommended for noise-free signal paths.

CySTA 5B08 & CySSR 24 Fully Isolated System



CySSR 24 Panel holds up to 24 Isolated Solid-State Relays & Power Sensing Modules
Solid-State Opto-22 I/O Modules (See Full PC Systems HandBook). *CySSR* 24 Mounting Rack on page 75.

CySTA 5B08/16 Isolated Data Acquisition System



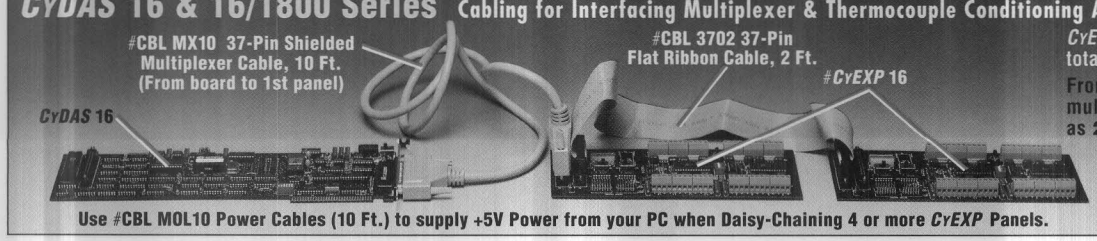
CyDAS 8 & 800 Series Cabling for Interfacing Multiplexer & Thermocouple Conditioning Accessory Panels: CyEXP 16 & CyEXP 32

Use #CBL MOL10 Power Cables (10 Ft.) to supply +5V Power from your PC when Daisy-Chaining 4 or more *CyEXP* Panels.

Our *CyEXP* 16 & 32 multiplexer panels may be cascaded to expand the total number of Analog Input Channels.

Multiple panels can raise the number of inputs on a *CyDAS* 8 or 800-series board from 8 Single-Ended Channels to as many as **128** Channels, *Fully Differential*. Use #CBL 3702, 3705, or 3710 to daisy-chain additional panels.

CyDAS 16 & 16/1800 Series Cabling for Interfacing Multiplexer & Thermocouple Conditioning Accessory Panels: CyEXP 16 & 32



Use #CBL MOL10 Power Cables (10 Ft.) to supply +5V Power from your PC when Daisy-Chaining 4 or more *CyEXP* Panels.

CyEXP 16 & 32 panels are used to expand the total number of Analog Input Channels.

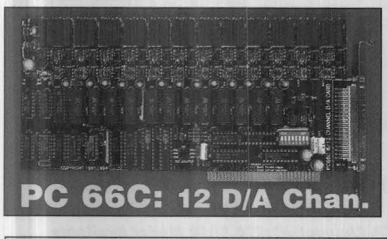
From a *CyDAS* 16 or 1600/1800-series board, multiple *CyEXP* panels can provide as many as **256** *Fully Differential* A/D Channels.

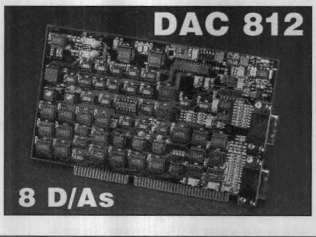
Use **#CBL MX10** to connect your A/D board to the first panel from a *CyDAS* 16/1600/1800 board. Use #CBL 3702 or 3705 to daisy-chain additional panels.

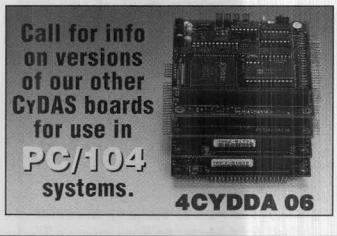
CyberResearch Analog Output Boards for the PC

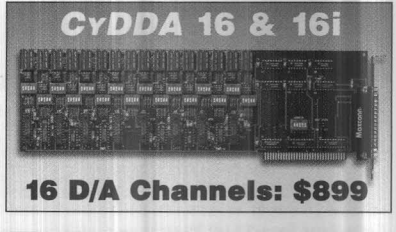
Part #	Price	Page	PC/104 Model	Analog Output Specifications: Number of Analog Outputs	Resolution	Output Ranges: Unipolar Output Ranges	Bipolar Output Ranges	Current Output Range	Maximum Analog Output Rate	Double Buffered	Self-Calibrating	Self-Diagnostics	Software Included Free with Board	Digital I/O: Number of Digital I/O Lines	Digital I/O Current Sink	Third-Party Software Support
#4CYDDA 06	$399	PC/104 Model	6	12 bits	0-5, 10V	±5, 10V	4-20mA ver. available	25kHz	Y	N	N	Utility Software	–	–	HPV, LabTN, SnapM, UDR, LabV†
#ACAO 122/8	2: $395 8: $995	69	2/8	12 bits	0-5, 10V	±5V	4-20mA	130kHz	N	Y	Y	QuickLog	8 Indiv.	50mA	WorkBench (Pg 69), LabTN
#CYDAC 02	$155	70	2	12 bits	0-5, 10V	±5, 10V	4-20mA	6kHz	Y	N	N	Utility Software	–	–	DASY, HPV, LabTN, SnapM, UDR, LabV†
#CYDAC 02HR	$249	70	2	12 bits	0-2.5, 5, 10V	±2.5, 5, 10V	–	35kHz	Y	N	N	Utility Software	–	–	DASY, HPV, LabTN, SnapM, UDR, LabV†
#CYDDA 02JR	$149	70	2	12 bits	–	±5V	–	35kHz	Y	N	N	Utility Software	Two 8-Bit Ports, Two 4-Bit Ports	64mA	HPV, LabTN, UDR, LabV†
#CYDDA 02JRHR	$249	70	2	16 bits	–	±5V	–	35kHz	Y	N	N	Utility Software	Two 8-Bit Ports, Two 4-Bit Ports	64mA	HPV, LabTN, UDR, LabV†
#CYDDA 04JR	$199	70	4	12 bits	–	±5V	–	35kHz	Y	N	N	Utility Software	Two 8-Bit Ports, Two 4-Bit Ports	64mA	HPV, LabTN, UDR, LabV†
#CYDDA 04JRHR	$349	70	4	16 bits	–	±5V	–	35kHz	Y	N	N	Utility Software	Two 8-Bit Ports, Two 4-Bit Ports	64mA	HPV, LabTN, UDR, LabV†
#CYDDA 06JR	$249	70	6	12 bits	–	±5V	–	35kHz	Y	N	N	Utility Software	Two 8-Bit Ports, Two 4-Bit Ports	64mA	HPV, LabTN, UDR, LabV†
#CYDDA 06JRHR	$449	70	6	16 bits	–	±5V	–	35kHz	Y	N	N	Utility Software	Two 8-Bit Ports, Two 4-Bit Ports	64mA	HPV, LabTN, UDR, LabV†
#CYDDA 06	$345	70	6	12 bits	0-1.67, 2.5, 5, 10V	±1.67, 2.5, 5, 10V	–	200kHz	Y	N	N	Utility Software	Two 8-Bit Ports, Two 4-Bit Ports	2.5mA	DASY, HPV, LabTN, SnapM, UDR, LabV†
#CYDDA 06H	$799	70	6	16 bits	0-5, 10V	±2.5, 5, 10V	–	100kHz	Y	N	N	Utility Software	Two 8-Bit Ports, Two 4-Bit Ports	2.5mA	HPV, LabTN, SnapM, UDR, LabV†
#CYDDA 08	$499	71	8	12 bits	0-2.5, 5, 10V	±2.5, 5, 10V	–	100kHz	Y	N	N	Utility Software	–	–	DASY, HPV, LabTN, SnapM, UDR, LabV†
#CYDDA 08i	$499	71	8	12 bits	–	–	4-20mA	100kHz	Y	N	N	Utility Software	–	–	HPV, LabTN, SnapM, UDR, LabV†
#CYDDA 08HR	$799	71	8	16 bits	0-5, 10V	±5, 10V	–	80kHz	Y	N	N	Utility Software	–	–	DASY, HPV, LabTN, SnapM, UDR, LabV†
#CYDDA 16	$899	71	16	12 bits	0-2.5, 5, 10V	±2.5, 5, 10V	–	100kHz	Y	N	N	Utility Software	–	–	DASY, HPV, LabTN, SnapM, UDR, LabV†
#CYDDA 16i	$899	71	16	12 bits	–	–	4-20mA	100kHz	Y	N	N	Utility Software	–	–	HPV, LabTN, SnapM, UDR, LabV†
#CYDDA 16HR	$1399	71	16	16 bits	0-5, 10V	±5, 10V	–	80kHz	Y	N	N	Utility Software	–	–	DASY, HPV, LabTN, SnapM, UDR, LabV†
#DAC 812	$599	–	8	12 bits	0-5, 10V	±2.5, 5, 10V	4-20mA	200kHz	Y	N	N	High-Level Drivers	3 x 8 Bits	1.7mA	LabTN
#PC 66C	$695	–	12	12 bits	0-5, 10V	±5, 10V	–	500kHz	Y	N	N	Example Programs	–	–	DASY, LabV, TestP
#PC 66CA	$595	–	8	12 bits	0-5, 10V	±5, 10V	–	500kHz	Y	N	N	Example Programs	–	–	DASY, LabV, TestP
#PC 266	$795	–	4	16 bits	–	±10V	–	50kHz	Y	N	N	Example Programs	3 indiv. in	–	DASY, LabV, TestP
#PCL 727	$695	69	12	12 bits	0-5, 10V	±5V	–	25kHz	Y	N	N	Example Programs	16 in,16 out	8mA	DASY, Genie, LabTN
#PCL 728	$275	69	2	12 bits	0-5, 10V	±5, 10V	0 or 4-20mA	16kHz	Y	N	N	Example Programs	–	–	DASY, Genie, LabTN

UDR = Universal Driver Library ($49, see pg 60). **DASY** = DASY*Lab* (pg 76). **HPV** = HP VEE (pg 61). **LabTN** = Labtech Notebook/Control (pg 76). **SnapM** = SnapMaster (pg 76).
† = Requires the LabVIEW® Driver Upgrade for CyDAS UDR, (#CyDAS ULV, see pg 60). **LabV** = LabVIEW,® a registered trademark of National Instruments. **TestP** = TestPoint (pg 78).

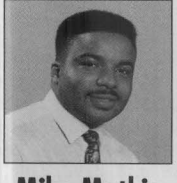








Tech Notes



Mike Mathis

Analog Output Boards vs. Waveform Synthesizers

What is the difference between **Analog Output** boards and **Waveform Synthesizers**? A Digital to Analog (D/A) converter is the basic component of both types of boards. Waveform Synthesizers contain on-board memory and on-board counter/timers which give them precise frequency and amplitude control. Analog Output boards, on the other hand, are not designed to output precise waveshapes. They maintain a constant output level unless instructed otherwise.

Analog Output Boards Ideal for PID Loop Control

All of our Analog Output boards work in the same manner. The full-scale output range is divided into 4096 steps (2^{12} for 12-bit resolution). A 12-bit word, which corresponds to the desired number of steps out of 4096, is written to an address register for each analog output port on the board. The speed at which you write data to this register becomes the rate at which you can update the analog output voltage level. Control of your waveform frequency is determined by the timing of your software loop. This design is perfect for most common applications like PID control because the analog output maintains a constant level until the next time the register is updated.

Memory Buffers and Precise Frequency Control

Our Waveform Synthesizer boards, in contrast, have an on-board memory buffer which can hold a pre-defined array of data points. This gives you greater flexibility in creating arbitrary waveform shapes. These boards also provide on-board counter/timers for precise frequency control. In addition to these two fundamental differences, our waveform synthesizer boards have many other advanced features, and are detailed in the full-size edition (204 pages) of the *PC Systems Handbook*.

Many of our Analog Input boards include analog output channels as well. Our **HSDAS/LSDAS** boards (page 56), for example, include D/A outputs with several unique features.

CyberResearch Assistance: Toll-Free 1-800-341-2525 (USA) ☎ Tel: 203-483-8815 Fax: 203-483-9024
Applications Engineers: Mon-Fri, 9AM-5PM U.S. Eastern Time • **Internet Website:** http://www.cyberresearch.com • **Fax-on-Demand System:** 203-483-9966 • **BBS:** 203-488-8949

Analog Connection Precision D/A Boards

Our Analog Connection D/A boards give you a choice of 2 or 8 analog output channels. Each output has its own D/A converter capable of 130,000 updates per second on a standard PC. Response time with full accuracy is:

- 2.5 µseconds for a small step
- 20 µseconds for a 5V step
- 35 µseconds for a 10V step

Each board gives you 12-bit resolution with a choice of output ranges including 0–5V, ±5V, 0–10V, & 4–20mA current loop.

Automatic Self-Calibration

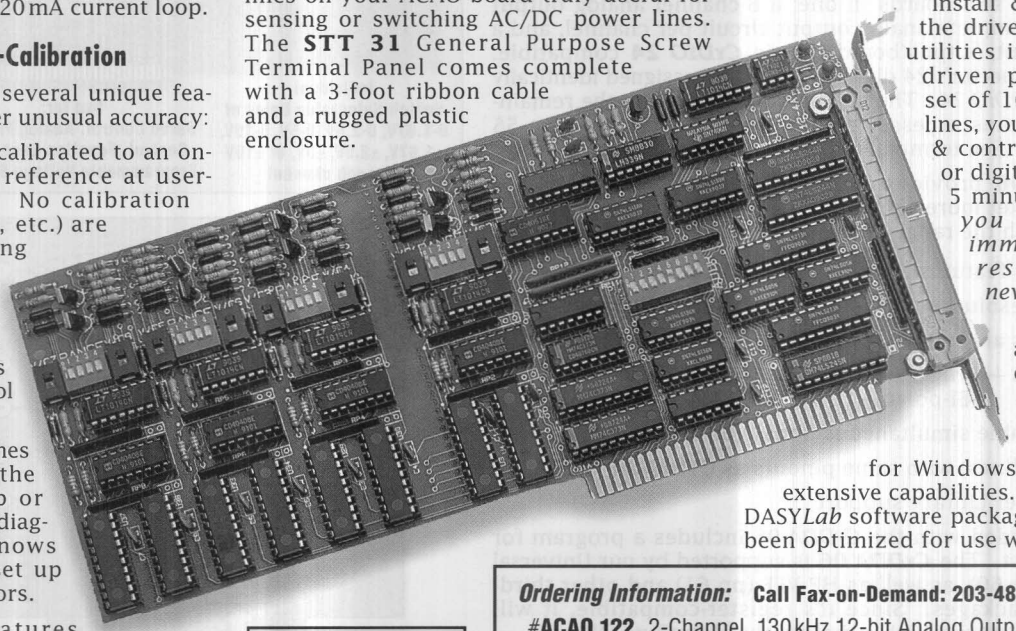
These boards have several unique features designed to deliver unusual accuracy:

- Each output is self-calibrated to an on-board ultra-stable reference at user-defined intervals. No calibration adjustments (pot's, etc.) are required, eliminating a common source of drift and noise — important in the rugged and hazard-ridden environments where process control systems are found.
- Self-diagnostic routines are performed by the board at power-up or on command. The diagnostic software knows how the board is set up and reports any errors.

These special features result in a relative accuracy error of only 0.01% maximum, with an absolute accuracy — all errors including calibration — of only 0.02% maximum. Self-calibration alone reduces temperature drift by a factor of 4.

Digital I/O for a Complete Solution

In addition to the analog outputs, 8 digital I/O lines are provided. Each line is able to sink up to 50mA – more than enough to handle mechanical or Opto22-type relays. *Each I/O point may be individually configured for input or output, greatly increasing your flexibility.* Our **STT 31** General Purpose Terminal Panel includes mounting sockets for 8 Opto22–style solid state relays (call for a list of relays). This makes the digital I/O lines on your ACAO board truly useful for sensing or switching AC/DC power lines. The **STT 31** General Purpose Screw Terminal Panel comes complete with a 3-foot ribbon cable and a rugged plastic enclosure.



QuickLog Software Included Free

Not only are Analog Connection boards accurate and flexible, they're also the easiest to use, now that **QuickLog** software is included ***free*** with every ACAO board. A Windows program with a graphical user interface, QuickLog is remarkably easy to use yet rivals the functionality of many premium software packages on the market.

QuickLog will have you up and running in seconds. Just insert the diskette, type "Install" & QuickLog installs the drivers, programs and utilities in an easy menu-driven process. Using a set of 16 icons and snap lines, you can be measuring & controlling any analog or digital I/O in less than 5 minutes. *Each action you take displays immediate real-time results, so you're never in the dark.*

For complex applications, we offer **WorkBench for Windows** software. (Win3.1 /95). WorkBench for Windows has much more extensive capabilities. It's built from the DASY*Lab* software package (pg 76), but it's been optimized for use with ACAO boards.

Return your Reply Card for Future Editions

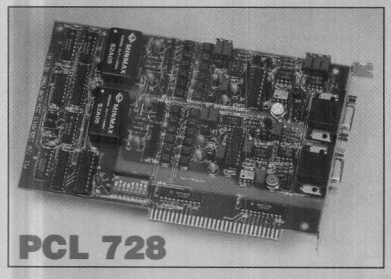
Ordering Information: **Call Fax-on-Demand: 203-483-9966 FOD#4504**

#ACAO 122	2-Channel, 130kHz 12-bit Analog Output Board	**$395**
#ACAO 128	8-Channel, 130kHz 12-bit Analog Output Board	**$995**
#STT 31	General Purpose Terminal Panel w/Cable & Enclosure	**$189**
#STS 100	WorkBench for Windows (DASY*Lab*) Software	**$995**

Isolated Analog Output Card Protects Your PC

Analog output cards often wind up in severe environments. Yet while digital I/O lines routinely are protected with opto-isolated relays, until now there was no alternative to protect your analog output lines. Opto-isolators give the **PCL 728** 500 volts isolation to protect both the card and your PC from dangerous voltages.

Utility software included, w/calibration program & programming examples. Supported by Labtech NOTEBOOK/CONTROL.



- >500VDC isolation (channel-to-channel & input-to-output)
- 12-bit resolution, double-buffered D/A converters
- Settling time: < 60µsec (16kHz)
- Output ranges: 0–5V, 0–10V, ±5V, ±10V, 0–20mA, 4–20mA
- Two DB-9 output lines, 1 per isolated output

Ordering Information: Call Fax-on-Demand: **203-483-9966 FOD#4508/7**

#PCL 727	12-Channel Analog Output (D/A) Board w/32 DIO	**$695**
#PCL 728	Isolated 2-Channel Analog Output Board	**$275**
#INST 338A	37-pin Screw Terminal Block for PCL 727 (w/6' Cable)	**$79**

12-Channel D/A Card with 32 Digital I/O

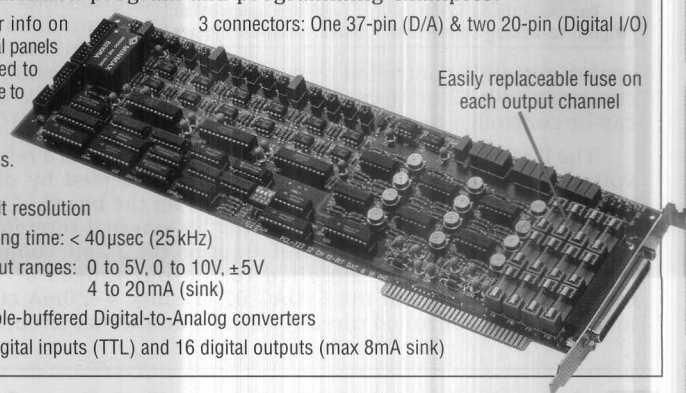
Our **PCL 727** is the ideal economical solution for applications requiring multiple PID output loops. Twelve independent analog output (D/A) channels can be individually configured. The on-board DC/DC converter ensures that there is always sufficient power for full output on each channel. To avoid accidental damage to the card or your PC, all output channels are reset to 0V after reset or power-on, and individual fuses are installed on each channel.

A utility software diskette included with each board includes a calibration program and programming examples.

Call for info on terminal panels designed to interface to the 32 digital I/O lines.

3 connectors: One 37-pin (D/A) & two 20-pin (Digital I/O)

Easily replaceable fuse on each output channel



- 12-bit resolution
- Settling time: < 40µsec (25kHz)
- Output ranges: 0 to 5V, 0 to 10V, ±5V 4 to 20mA (sink)
- Double-buffered Digital-to-Analog converters
- 16 digital inputs (TTL) and 16 digital outputs (max 8mA sink)

Record-Breaking Price/Performance!

MetraByte-Compatible Analog Output Choice of: 2, 6, 8 or 16 D/A Channels

With the addition of our newest 16-bit **HR** models and PC/104 module, we now offer more high performance options than ever for analog output, at **savings of 40% or more** over MetraByte's prices for comparable products. *NEW* **16-bit** versions offer 16x greater resolution, without the outrageous prices charged by others.

6-Channel Analog Output Boards with 24 Digital I/O

Our ***CyDDA* 06** 6-channel D/A boards are available with either 12-bit (1 part in 4,096) or 16-bit (1 part in 65,536) resolution. The ***CyDDA* 06** is two boards in one: a 6-channel analog output board with one complete analog output circuit per channel, and a 24-bit digital input/output board that is ***CyDIO* 24** compatible. The 37-pin "D" connector's 24 digital I/O pins are assigned identically to those on the *CyDIO* 24. The analog outputs occupy the remaining pins. This means accessories like the *CySSR* 24 on page 55 just plug right in. See terminal panels and cabling on page 44.

The ***CyDDA* 06** provides different stages of gain/range to allow you to bracket more closely the signal you wish to simulate, or to exactly match the range of the device you wish to control.

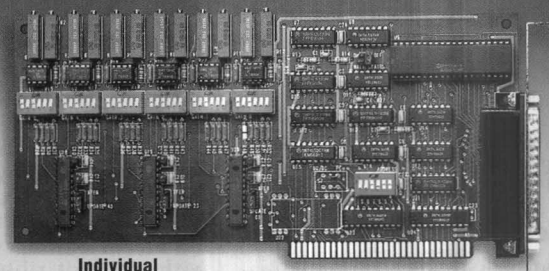
Some of the many features built into the ***CyDDA* 06** include:

- 12 or 16-bit Resolution
- Double-buffered D/A converters
- Output Ranges are individually selectable on each channel
- Output Ranges — Unipolar: 0–10V, 0–5V, 0–2.5V, & 0–1.67V
  Bi-polar: ±10V, ±5V, ±2.5V, & ±1.67V
- Jumper-selectable simultaneous update of 2, 4, or 6 channels
- 24 digital I/O lines, with same pinouts as CYDIO 24
- Universal Driver Library support

Software provided with the *CyDDA* 06 includes a program for calibration and test. The ***CyDDA* 06** is supported by our Universal Driver Library (pp 60), as well as HP VEE (pp 61) and other third-party software packages. Since it's register-compatible, it will work with any software which supports the MetraByte DDA-06.

The ***CyDDA* 06JR** is nearly identical, save that it has only a ±5V output range, & the digital I/O can handle up to 64mA current sink.

CyDDA 06 — 6 Channels of 12 or 16-bit D/A & 24 Digital I/O



Register Compatible with MetraByte DDA-06

37-pin Connector

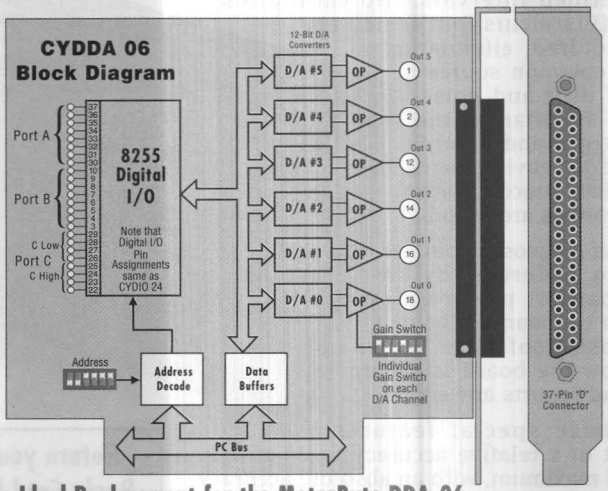
Interface with Terminal Panels & Cables: Page 44

24 TTL-Level Digital I/O Lines: Two 8-bit ports & Two 4-bit Ports

One Complete Analog Output Circuit per Channel

Individual Switch-Selectable Gains of 0-1.67V, 0-2.5V, 0-5V, 0-10V, ±1.67V, ±2.5V, ±5V, or ±10V on each channel

Use for: Servo Control, Analog Process Control, Function Generator, Programmable Voltage Source.



The Ideal Replacement for the MetraByte DDA-06

Low-Cost 2-Channel 12 or 16-bit Analog Output

CyDAC 02

Two Analog Voltage Outputs of: 0-5V, 0-10V, ±5V, ±10V 4-20mA Current

Jumpers for On-Board Reference Voltage

25-pin "D" Type Connector

Register Compatible with MetraByte DAC-02

Use with HP VEE (page 61) or Universal Driver Library

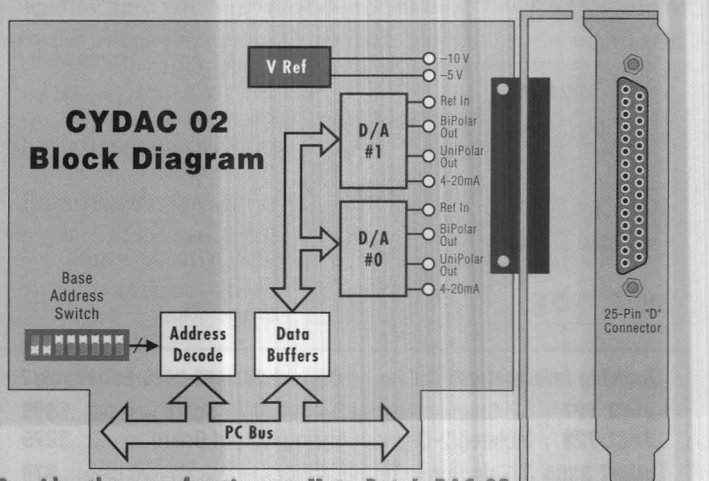
Two Multiplying 12-bit Digital-to-Analog Converters

The ***CyDAC* 02** is the epitome of a simple, economical design. It provides two independent double-buffered, 12-bit (CyDAC 02) or 16-bit (CyDAC 02HR) D/A channels for use in process control, motion control, as a function generator, and in other industrial and laboratory applications. Each analog output is controlled by a precision digital-to-analog (D/A) converter with 12 or 16-bit resolution. On a scale of 0-5V, output can be controlled to within 1.22mV (12-bit) or 0.0762mV (16-bit).

The D/A converter's output range is proportional to a reference voltage. The analog output range may be selected by placing shorting blocks on the jumpers provided on the board. Custom output ranges can be set by providing an external reference AC or DC voltage (±10V max., via Vref input on the 25-pin connector.) Reference voltages are supplied for output ranges of 0–5V, 0–10V, ±5V, ±10V. On the CyDAC 02 (12-bit), 4–20mA current loops may be controlled directly with no additional circuitry.

Startup software is provided with the board which includes a program for calibration & test. The ***CyDAC* 02** is also supported by our Universal Driver Library (page 60) as well as HP VEE and other third-party software packages (pages 76-77). Since it's register compatible, it's designed to work with any software which supports the MetraByte DAC-02. Better yet, it costs **40% less!**

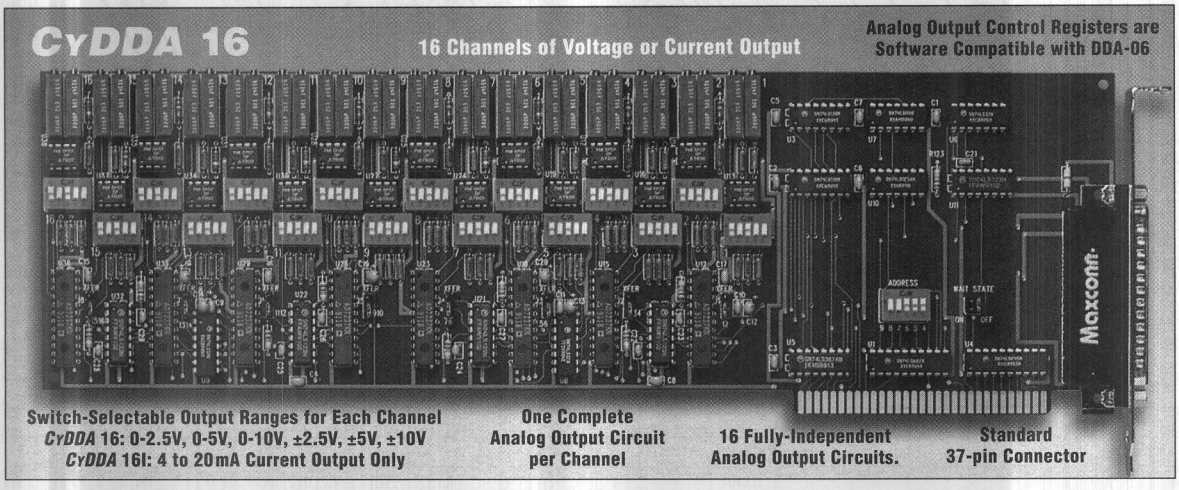
The **CyDAC 02HR** brings 16-bit resolution within the tightest budget. Settling time to 0.0008% is 6µs (10V step), 19µs max (20V).



Provides the same functions as MetraByte's DAC-02

CyberResearch Assistance: Toll-Free 1-800-341-2525 (USA) Tel: 203-483-8815 Fax: 203-483-9024
Applications Engineers: Mon-Fri, 9AM-5PM U.S. Eastern Time • Internet Website: http://www.cyberresearch.com • Fax-on-Demand System: 203-483-9966 • BBS: 203-488-8949

D/A Boards: *CyDAC 02 and CyDDA* 06, 08, or 16
• 12 or 16-bit • Current or Voltage • 24 Digital I/O



CyDDA 08 & 16 Pinout

–12V	19	37	GND
GND	18	36	+5V
+12V	17	35	LLGND
D/A 15 OUT	16	34	LLGND
D/A 14 OUT	15	33	LLGND
D/A 13 OUT	14	32	LLGND
D/A 12 OUT	13	31	LLGND
D/A 11 OUT	12	30	LLGND
D/A 10 OUT	11	29	LLGND
D/A 9 OUT	10	28	LLGND
D/A 8 OUT	9	27	LLGND
D/A 7 OUT	8	26	LLGND
D/A 6 OUT	7	25	LLGND
D/A 5 OUT	6	24	LLGND
D/A 4 OUT	5	23	LLGND
D/A 3 OUT	4	22	LLGND
D/A 2 OUT	3	21	LLGND
D/A 1 OUT	2	20	LLGND
D/A 0 OUT	1		

Standard 37-pin Male D-Connector
Note: Pins 9 to 16 are N/C on CyDDA 08.

8 or 16 Channels of Analog Output on 1 Card

Our new ***CyDDA* 08** and ***CyDDA* 16** 8 or 16-channel D/A boards boast the lowest cost-per-point ever for PC-compatible analog output boards. Each output channel is a fully independent, double-buffered, 12-bit multiplying D/A converter. A wide range of voltage outputs may be individually selected on each channel. In addition, models with 4 to 20mA current output only are also available. Because they use the same D/A converters and selectable address ranges as the MetraByte DDA-06, systems developed for that board are easily upgraded to handle 8 or 16 output channels.

The ***CyDDA* 08** and **16** feature:

- Choice of 8 or 16 fully-independent analog output circuits (no sample-&-hold or multiplexing required – has 1 DAC/channel)
- 12-bit or 16-bit resolution. Double-buffered D/A converters
- Output ranges are selected via individual DIP switches
- Voltage Output Ranges — Unipolar: 0–10V, 0–5V, and 0–2.5V
  Bipolar: ±10V, ±5V, and ±2.5V
- Current Output Range: 4-20mA ("**I**" Models Only)
- Software disk with calibration and test software
- Jumper-Selectable Simultaneous Update. Groups of D/As, or the entire 16 channels may be set to update simultaneously
- Universal Driver Library support

Compatible with Most Applications Software

Each of these analog output boards come supplied with a complete user's manual, along with software for calibration and test. In addition, due to their MetraByte compatibility, these boards can be controlled from virtually any applications software package that supports MetraByte's DDA-06, such as **HP VEE** or **LABTECH NOTEBOOK** (pages 76-77).

CyDDA analog output boards can be easily programmed from any language using simple I/O port commands. Two 8-bit addresses are assigned to each output port, and the analog output level is updated when the MSB (Most Significant Bit) is written, a technique known as double buffering.

Our Universal Driver Library (#**CyDAS UDR,** page 60) provides high-level language support for:

- Single-Channel Analog Output
- Simultaneous Update of Multiple Analog Outputs
- Digital Configuration and Control *(CyDDA* 06 models only)
- Digital Bit Read/Write *(CyDDA* 06 models only)
- Digital Port Read/Write *(CyDDA* 06 models only)

Compatible with CyDAS Terminal Panels & Cabling

Our low-cost terminal panels will help you save even more money. Priced at up to 40% less than MetraByte, we recommend the **INST 338A** 25-pin cable & terminal set with the ***CyDAC* 02.** The ***CyDDA* 06/08/16** series can be used with our broad selection of 37-pin screw terminal panels. See page 64 for panels & cabling.

Ordering Information: **SAVE up to 40% NOW!**

#CYDAC 02 2-Ch. 12-bit Analog Output (D/A) Bd. (DAC-02, 25-pin)..**$155**
#CYDAC 02HR 2-Channel **16-bit** Analog Output (D/A) Bd. (25-pin)..**$249**
#INST 338A Screw Terminal Block w/25-pin 6-ft cable (for *CyDAC* 02).....**$79**

#CYDDA 02JR 2-Channel 12-bit Analog Output, 24 Digital I/O.....**$149**
#CYDDA 04JR 4-Channel 12-bit Analog Output, 24 Digital I/O.....**$199**
#CYDDA 06JR 6-Channel 12-bit Analog Output, 24 Digital I/O.....**$249**
#CYDUAL DAC 2-Channel D/A Chip (Adds 2 D/A Channels to *CyDDA* JR) ...**$50**
Double-buffered 12-bit D/A channels, ±5V output range only. Capacity of board is 6 D/A channels – may be purchased with only 2 or 4 D/As; upgradeable later via the CYDUAL DAC.

#CYDDA 02JRHR 2-Channel **16-bit** Analog Output, 24 Digital I/O.....**$249**
#CYDDA 04JRHR 4-Channel **16-bit** Analog Output, 24 Digital I/O.....**$349**
#CYDDA 06JRHR 6-Channel **16-bit** Analog Output, 24 Digital I/O.....**$449**
#CYDUAL DACHR 2-Channel **16-bit** D/A Chip (Adds 2 Chan. to JRHR)...**$100**
Double-buffered 16-bit D/A channels, ±5V output range only. Capacity of board is 6 D/As – may be purchased with only 2 or 4 D/As; upgradable later via the CYDUAL DACHR.

#CYDDA 06 6-Channel 12-bit Analog Output, 24 Dig. I/O (DDA-06)...**$345**
#CYDDA 06H 6-Channel **16-bit** Analog Output, 24 Digital I/O.....**$799**

#CYDDA 08 8-Channel 12-bit Analog Voltage Output (DDA-08) **$499**
#CYDDA 08I 8-Channel 12-bit Analog 4-20mA Current Output....**$499**
#CYDDA 08HR 8-Channel **16-bit** Analog Voltage Output.....**$799**

#CYDDA 16 16-Channel 12-bit Analog Voltage Output (DDA-16)....**$899**
#CYDDA 16I 16-Channel 12-bit Analog 4-20mA Current Output...**$899**
#CYDDA 16HR 16-Channel **16-bit** Analog Voltage Output.....**$1399**

#4CYDDA 06 **PC/104:** 6-Chan. 12-bit D/A Module (40-pin) **$399**
#4CYDDA 06I **PC/104:** 6-Chan. 12-bit 4-20mA Current Output....**$399**

#CYSTP 37 Mini Terminal Panel (no enclosure, 37-pin cable required).....**$59**
#CYSTP 37A Mini Terminal Panel with enclosure (37-pin cable required)....**$69**
#CBL 3702 37-pin 2-Ft Cable (CYDDA 06/08/16 to CYSTP 37 or STA 01)..**$25**
#CBL 3705 37-pin 5-Ft Shielded Cable (CYDDA to CYSTP 37 / STA 01)..**$39**

#CYDAS UDR Universal Driver Library for CyDAC/DDA Boards **$49**

The price includes FREE software to install, calibrate, and test each board. The Universal Driver Library (page 60) provides universal programming language support for all *CyDAC* & *CyDDA* boards for all DOS and Windows languages. See pages 64-67 for terminal panels and cables.

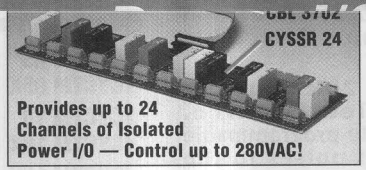
DIGITAL I/O BOARD COMPARISON CHART

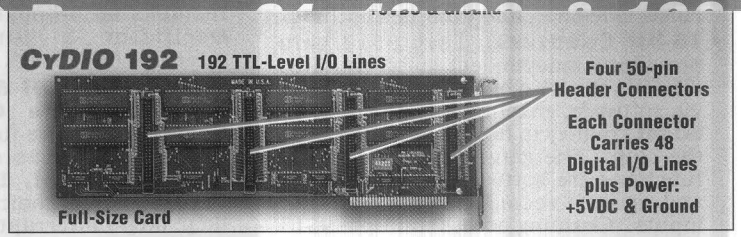
CyberResearch Counter/Timer & Digital I/O Boards for the PC

Part #	Price	Page Number	Digital I/O Specifications: Number of Digital I/O Lines	Transfer Rates: Maximum w/Program I/O	Transfer Rates: Typical w/Program I/O	Transfer Rates: Maximum w/DMA	Transfer Modes: Program I/O	Transfer Modes: Interrupt-Driven	Transfer Modes: DMA Mode	Transfer Modes: Bi-Directional	Transfer Modes: 16-Bit Data Transfers	Other Features: Output Current Sink / Ratings	Other Features: Other Features	Other Features: Opto-22 Compatible Connector	Other Features: Counter/Timer Controlled I/O	Other Features: Software Drivers Included	Counter/Timer Specifications: Number of Channels	Maximum Frequency	Alarm Registers	Cascadable Counters	Resolution (in Bits)	24-Hour Time-of-Day Mode	Connector – Number of Pins	Third-Party Software Support*
#CYCTM 05	$137	74	8 in/8 out	-	-	-	Y	Y	-	-	-	8mA	100ppm Xtal or 50ppm Xtal	-	Y	-	5	7 MHz	2 Ch	Y	16B	Y	37	HPV, LTN, SM, UDR, LV
#CYCTM 05X	$179	74	8 in/8 out	-	-	-	Y	Y	-	-	-	8mA	100ppm Xtal or 50ppm Xtal	-	Y	-	5	7 MHz	2 Ch	Y	16B	Y	37	HPV, LTN, SM, UDR, LV
#CYCTM 10	$239	74	16 in/16 out	-	-	-	Y	Y	-	-	-	8mA	100ppm Xtal or 50ppm Xtal	-	Y	-	10	7 MHz	2 Ch	Y	16B	Y	37	HPV, LTN, SM, UDR, LV
#CYCTM 10X	$279	74	16 in/16 out	-	-	-	Y	Y	-	-	-	8mA	100ppm Xtal or 50ppm Xtal	-	Y	-	10	7 MHz	2 Ch	Y	16B	Y	37	HPV, LTN, SM, UDR, LV
#CYCTM 10H	$219	74	-	-	-	-	Y	Y	-	-	-	-	100ppm Xtal or 50ppm Xtal	-	Y	-	10	7 MHz	-	Y	16B	Y	50	HPV, LTN, SM, UDR, LV
#CYCTM 10HX	$259	74	-	-	-	-	Y	Y	-	-	-	-	100ppm Xtal or 50ppm Xtal	-	Y	-	10	7 MHz	-	Y	16B	Y	50	HPV, LTN, SM, UDR, LV
#4CYCTM 10H	$249	PC/104 Call	-	-	-	-	Y	Y	-	-	-	-	100ppm Xtal or 50ppm Xtal	-	Y	-	10	7 MHz	-	Y	16B	Y	50	HPV, LTN, SM, UDR, LV
#CYCTM 20H	$359	74	-	-	-	-	Y	Y	-	-	-	-	100ppm Xtal or 50ppm Xtal	-	Y	-	20	7 MHz	-	Y	16B	Y	50	HPV, LTN, SM, UDR, LV
#CYCTM 20HX	$399	74	-	-	-	-	Y	Y	-	-	-	-	100ppm Xtal or 50ppm Xtal	-	Y	-	20	7 MHz	-	Y	16B	Y	50	HPV, LTN, SM, UDR, LV
#PPIO CTR6	$149	Call	4 in/4 out, & 4 selectable in/out	-	3k	-	Y	-	-	Y	-	2.5mA	Includes parallel cable	-	-	-	6	10 MHz	-	Y	16B	-	37	LTN, UDR, LV
#ACDIO 40	$295	Call	40 Indiv.	200k	-	-	Y	-	-	-	-	10mA	-	-	Y	Y	6	3 MHz	All	Y	16B	-	60	LTN, WorkBench
#ACDIO 160	$595	Call	160 Indiv.	200k	-	-	Y	-	-	-	-	10mA	-	-	Y	Y	24	3 MHz	All	Y	16B	-	60	LTN, WorkBench
#CYDIO 24	$47	73	2 x 8 bits, 2 x 4 bits	200k	-	-	Y	Y	-	Y	-	2.5mA	-	-	-	-	-	-	-	-	-	-	37	D, HPV, LTN, SM, UDR, LV
#CYDIO 24H	$67	73	2 x 8 bits, 2 x 4 bits	200k	-	-	Y	Y	-	-	-	64mA	-	-	-	-	-	-	-	-	-	-	37	D, HPV, LTN, SM, UDR, LV
#CYDO 24HV	$99	73	3 x 8 bits	200k	-	-	Y	Y	-	-	-	500mA @50V	-	-	-	-	-	-	-	-	-	-	50	HPV, LTN, UDR, LV
#CYDIO 24C	$99	73	2 x 8 bits, 2 x 4 bits	200k	-	-	Y	Y	-	-	-	2.5mA	-	-	-	-	3	10 MHz	-	Y	16B	-	37	HPV, LTN, SM, UDR, LV
#PCYDIO 24/3	$145	73	3 x 8 bits	200k	-	-	Y	Y	-	-	-	2.5mA	-	-	-	-	3	10 MHz	-	Y	16B	-	PCMCIA	D, HPV, LTN, SM, UDR, LV
#PPIO D24H	$99	Call	3 x 8 bits	-	3k	-	Y	-	-	Y	-	64mA	Includes parallel cable	-	-	-	-	-	-	-	-	-	37	LTN, UDR, LV
#CYDIO 48	$79	73	4 x 8 bits, 4 x 4 bits	200k	-	-	Y	-	-	Y	-	2.5mA	-	-	-	-	-	-	-	-	-	-	50	D, HPV, LTN, SM, UDR, LV
#4CYDIO 48	$99	PC/104 Call	4 x 8 bits, 4 x 4 bits	200k	-	-	Y	-	-	Y	-	2.5mA	-	-	-	-	-	-	-	-	-	-	50	D, HPV, LTN, SM, UDR, LV
#CYDIO 48H	$129	73	4 x 8 bits, 4 x 4 bits	200k	-	-	Y	-	-	Y	-	64mA	-	-	-	-	-	-	-	-	-	-	50	D, HPV, LTN, SM, UDR, LV
#CYDIO 48HP	$229	Call	4 x 8 bits, 4 x 4 bits	200k	-	-	Y	-	-	Y	-	64mA	-	-	-	-	-	-	-	-	-	-	50	D, HPV, LTN, SM, UDR, LV
#CYDI 48	$79	Call	6 x 8 bits	200k	-	-	Y	-	-	Y	-	Inputs Only	-	-	-	-	-	-	-	-	-	-	50	HPV, UDR, LV
#4CYDI 48	$99	PC/104 Call	6 x 8 bits	200k	-	-	Y	-	-	Y	-	Inputs Only	-	-	-	-	-	-	-	-	-	-	50	HPV, UDR, LV
#CYDO 48H	$99	Call	6 x 8 bits	200k	-	-	Y	-	-	Y	-	64mA	-	-	-	-	-	-	-	-	-	-	50	HPV, UDR, LV
#4CYDO 48H	$129	PC/104 Call	6 x 8 bits	200k	-	-	Y	-	-	Y	-	64mA	-	-	-	-	-	-	-	-	-	-	50	HPV, UDR, LV
#CYDO 48HV	$139	Call	6 x 8 bits	200k	-	-	Y	-	-	Y	-	500mA @50V	-	-	-	-	-	-	-	-	-	-	50	LTN, HPV, SM, UDR, LV, TP
#CYDUAL AC5	$129	Call	6 x 8 bits	-	-	-	Y	-	-	Y	-	64mA	Replaces OPTO/Gordos	Y	-	-	-	-	-	-	-	-	50	HPV, LTN, UDR, LV
#CYDIO 96	$117	73	8 x 8 bits, 8 x 4 bits	200k	-	-	Y	-	-	Y	-	2.5mA	-	-	-	-	-	-	-	-	-	-	50	D, HPV, LTN, SM, UDR, LV
#CYDI 96	$109	Call	12 x 8 bits	200k	-	-	Y	-	-	Y	-	Inputs Only	-	-	-	-	-	-	-	-	-	-	50	UDR, LV
#CYDO 96H	$149	Call	12 x 8 bits	200k	-	-	Y	-	-	Y	-	64mA	-	-	-	-	-	-	-	-	-	-	50	UDR, LV
#CYDIO 192	$199	73	16 x 8 bits, 16 x 4 bits	200k	-	-	Y	-	-	Y	-	2.5mA	-	-	-	-	-	-	-	-	-	-	50	D, HPV, LTN, SM, UDR, LV
#CYDI 192	$159	Call	24 x 8 bits	200k	-	-	Y	-	-	Y	-	Inputs Only	-	-	-	-	-	-	-	-	-	-	50	HPV, UDR, LV
#CYDO 192H	$249	Call	24 x 8 bits	200k	-	-	Y	-	-	Y	-	64mA	-	-	-	-	-	-	-	-	-	-	50	HPV, UDR, LV
#CYINT 32	$99	Call	40 Indiv.	200k	-	-	Y	Y	-	Y	-	3.2mA	Vector Interrupt or DIO or CTRs	-	Y	-	6	2.5 MHz	All	Y	16B	-	50	HPV, LTN, UDR, LV
#CYPDISO 08	$147	74	8 Mech. Relays, 8 Isolated Inputs	-	-	-	Y	-	-	-	-	5A@120VAC 6A@28VDC	500V Isolation, 5 SPDT, 3 SPST	-	-	-	-	-	-	-	-	-	37	HPV, LTN, SM, UDR, LV
#CYPDISO 08P	$249	74	8 Mech. Relays, 8 Isolated Inputs	-	-	-	Y	-	-	-	-	5A@120VAC 6A@28VDC	500V Isolation, 5 SPDT, 3 SPST	-	-	-	-	-	-	-	-	-	37	HPV, LTN, SM, UDR, LV
#4CYPDISO 08	$249	PC/104 Call	8 Mech. Relays, 8 Isolated Inputs	-	-	-	Y	-	-	-	-	5A@120VAC 6A@28VDC	500V Isolation, 5 SPDT, 3 SPST	-	-	-	-	-	-	-	-	-	40	HPV, LTN, SM, UDR, LV
#CYPDISO 16	$259	74	16 Mech. Relays, 16 Isolated Inputs	-	-	-	Y	-	-	-	-	5A@120VAC 6A@28VDC	500V Isolation, 10 SPDT, 6 SPST	-	-	-	-	-	-	-	-	-	50	HPV, LTN, SM, UDR, LV
#CYPDISO 16P	$359	74	16 Mech. Relays, 16 Isolated Inputs	-	-	-	Y	-	-	-	-	5A@120VAC 6A@28VDC	500V Isolation, 10 SPDT, 6 SPST	-	-	-	-	-	-	-	-	-	50	HPV, LTN, SM, UDR, LV
#CYISO 48	$349	Call	48 Isolated Inputs 5-24VDC or AC	-	-	-	Y	-	-	-	-	Inputs Only	500V Isol.	-	-	-	-	-	-	-	-	-	50	HPV, LTN, SM, UDR, LV
#CYREL 08	$119	74	1 x 8 relays	500 Hz	-	-	Y	-	-	-	-	5A@120VAC 6A@28VDC	500V Isolation SPDT Relays	-	-	-	-	-	-	-	-	-	50	HPV, LTN, SM, UDR, LV
#CYREL 16	$155	74	2 x 8 relays	500 Hz	-	-	Y	-	-	-	-	5A@120VAC 6A@28VDC	500V Isolation SPDT Relays	-	-	-	-	-	-	-	-	-	50	HPV, LTN, SM, UDR, LV
#CYPDMA 16	$149	Call	2 x 8 bits	200k	200k	250k	Y	Y	Single	Y	-	2.5mA	Up to 125kW (16-bit Words)	-	Y	-	-	-	-	-	-	-	37	HPV, LTN, UDR, LV
#CYPDMA 32	$299	Call	2 x 8 bits	1 MB/s via Rep Insw	400k	400k	Y	Y	Single	Y	-	2.5mA	Up to 500kW (16-bit Words)	-	Y	-	-	-	-	-	-	-	37	HPV, LTN, UDR, LV
#PCL 720	$160	Call	32 in/32 out	500k	300k	-	Y	-	-	-	-	24mA	Has Bread-board Area	-	-	-	3	2.6 MHz	-	-	16B	-	20	Genie, LTN
#PCL 722	$280	Call	18 x 8 bits	500k	300k	-	Y	Y	-	-	-	96@12mA 48@24mA	Designed for Opto22 PB24	Y	-	-	-	-	-	-	-	-	50	D, Genie, LTN
#PCL 724	$99	Call	3 x 8 bits	500k	300k	-	Y	Y	-	-	-	24mA	Designed for Opto22 PB24	Y	-	-	-	-	-	-	-	-	50	D, Genie
#PCL 725	$175	Call	8 Relay outputs 8 buffered inputs	-	-	-	Y	-	-	-	-	8@1A out 8@5-24V in	4 SPDT Rel's, 4 SPST Relay	-	-	-	-	-	-	-	-	-	37	Genie, LTN
#RZC 48	$165	Call	48 Indiv.	200k	-	-	Y	Y	-	Y	-	12mA	-40 to +85°C -40 to +185°F	-	-	Y	-	-	-	-	-	-	50	-
#RZC 192	$425	Call	192 Indiv.	200k	-	-	Y	Y	-	Y	-	12mA	Indiv. Progr. Random Points	-	-	Y	-	-	-	-	-	-	50	-

*D = DASY*Lab*, pp. 76; **G** = Genie, pp. 51; **HPV** = HP VEE, pp. 61; **LTN** = Labtech Notebook/Control, pp. 76; **LV** = LabVIEW; **SM** = SnapMaster, pp. 76; **TP** = TestPoint, pp. 78; **UDR** = Universal Driver Library, pp. 60

CyberResearch Assistance: Toll-Free 1-800-341-2525 (USA) Tel: 203-483-8815 Fax: 203-483-9024
Applications Engineers: Mon-Fri, 9 AM-5 PM U.S. Eastern Time • **Internet Website:** http://www.cyberresearch.com • **Fax-on-Demand System:** 203-483-9966 • **BBS:** 203-488-8949





Monitor Contact Closures & Control Relays: *CyDIO* Family offers Digital I/O Boards at up to 60% Savings!

Because Digital I/O is not a "glamour area" in the data acquisition world, it may not always get the attention it deserves. Some manufacturers are still trying to sell you the same boards they developed 7 or 8 years ago! But at CyberResearch we understand how important digital I/O is to many of our customers. So we've developed our new high performance *CyDIO* family which includes the broadest selection of cost-effective digital I/O boards ever.

Our ***CyDIO* 24** enables you to add 24 easy to program digital I/O lines to your PC so you can start controlling relays and sensing contact closures. These boards are quite simple, consisting primarily of an Intel 8255 PPI chip on a PC board, they can be used for byte-wide or 4-bit I/O of TTL signals.

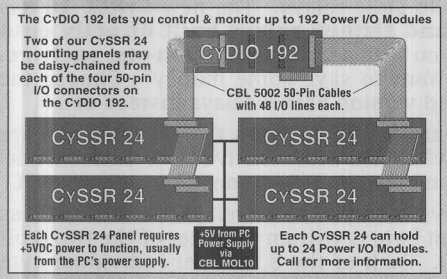
Our ***CyDIO* 24C** has three 16-bit counters (in addition to the 24 digital I/O lines like the *CyDIO* 24) which allow you to measure frequency or count events like the number of times a door opens or how many items pass by on a conveyor.

Our ***CyDIO* 24H & 48H** boards use discrete logic in place of the Intel 8255 to gain a high current sink (64mA) for such applications as switching solid state relays, lighting LEDs, and numerous other higher current tasks which are beyond the capabilities of simple TTL circuits like the 8255.

The ***CyDIO* 48** employs two 8255 parallel peripheral interface chips which are programmable in three modes: simple byte input, output, or strobed I/O. See page 64 for details on terminal panels & cabling.

With the ***CyDIO* 48**, ***CyDIO* 96**, and ***CyDIO* 192** you can economically sense and control 48, 96 or 192 digital I/O lines from a single slot in your PC. Accessories, including screw terminal and relay panels, interface to the same 50-pin connector.

The ***CyDIO*** family maintains compatibility with the 8255 in software, thereby simplifying your programming, and ensuring compatibility with such programs as Labtech NOTEBOOK. The 8255 is simple to program. Programming is done via ordinary IN and OUT statements. In addition, the entire ***CyDIO*** family is supported by the powerful Universal Driver Library, which provides a programming interface for DOS Basic, C, & Pascal; plus Visual Basic and Visual C++ for Windows. See page 60.



CyDIO Makes it Easy to Interface Your PC System with the Real World!

With our ***CyDIO*** family of Digital I/O boards you can turn your PC into an alarm system by sensing contact closures or use it to control lights, locks, motors, heaters, or any number of electronic devices that can be turned on and off. The high-current models are powerful enough to light LEDs and drive solid-state relays. The ***CyDIO*** TTL models can sense & control 0-5Volt logic level devices. For devices such as motors, you will need to purchase an electromechanical relay mounting panel or a buffered solid-state relay mounting panel *(CySSR or CyERB* on page 75). Our *CyDIO* family is supported by a wide range of accessories. See pages 64-67.

The ***CyDIO*** family members are guaranteed compatible with their MetraByte counterparts (PIO-12, PIO-24 & PIO-96) including hardware and software addressing. (Better yet, they offer unbelievable **60%+ savings!**). Call for more info.

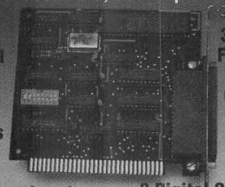
Ordering Information: **Call Fax-on-Demand; index is FOD#3001**

#CYDIO 24	24-Channel Digital I/O Board, TTL Level, 37-pin	**$47**
#CYDIO 24H	24-Chan. Digital I/O Board, High-Current (64mA), 37-pin	**$67**
#CYDIO 24C	24-Chan. Digital I/O Board, w/three 16-bit Counters, 37-pin	**$99**
#PCYDIO 24/3	24-Ch. PCMCIA I/O, w/three Counters	**$145**
#CYDIO 48	48-Channel Digital I/O Board, TTL-Level, 50-pin	**$79**
#CYDIO 48H	48-Chan. Digital I/O Board, High-Current (64mA), 50-pin	**$129**
#4CYDIO 48	**PC/104** 48-Chan. Digital I/O Module, TTL-Level, 50-pin	**$99**
#CYDIO 96	96-Channel Digital I/O Board, TTL-Level, 50-pin	**$117**
#CYDIO 192	192-Channel Digital I/O Board, TTL-Level, 50-pin	**$199**
#STA 01	Universal Screw Terminal Panel w/Prototyping Area, 37-pin	**$99**
#STA 50H	Heavy-Duty Spade Lug Terminal Panel, 37 & 50-pin	**$149**
#STA 100	100-line Universal Screw Terminal Panel, two 50-pin	**$149**
#CYSTP 50A	Mini Screw Terminal Panel, 50-pin, w/plastic box, cable req'd.	**$69**
#CYSTP 37A	Mini Screw Terminal Panel, 37-pin, w/plastic box, cable req'd.	**$69**
#CBL 3702	2-foot, 37-Conductor Ribbon Cable	**$25**
#CBL 5002	2-foot, 50-Conductor Ribbon Cable	**$25**
#CBL 5006	6-foot, 50-Conductor Ribbon Cable	**$35**

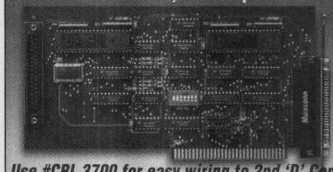
The price includes FREE software to install, calibrate, and test the board. A $49 Universal Driver Library (see page 60) provides universal programming language support for all *CyDAS* boards for all DOS and Windows languages. See pages 64-67 for terminal panels & cables.

Counter Timers & Digital I/O Accessories

CyCTM 05 5-Ch. Counter/Timer
Five 16-bit Counters, one 37-pin 'D' Conn.

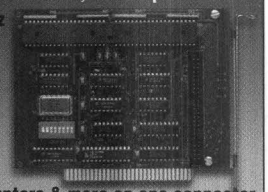


CyCTM 10 10-Ch. Counter/Timer
Ten 16-bit Counters, two 37-pin 'D' Conn.



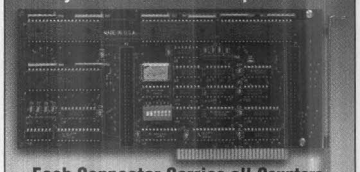
Use #CBL 3700 for easy wiring to 2nd 'D' Conn.
Up to 7MHz Fully-Progr. Inputs
16 Digital Outputs
16 Digital Inputs

CyCTM 10H 10-Ch. Cntr/Tmr
Ten 16-bit Counters, one 50-pin 'D' Conn.



All 10 Counters & more on one connector.
Programmable Interrupt to PC IRQ2-7.

CyCTM 20H 20-Ch. Counter/Tmr
Twenty Counters on two 50-pin 'D' Conn.



Each Connector Carries all Counters In/Out, Gates, Interrupt In, +5V & Ground.
See below for higher-accuracy 'X' models.

Our high performance AMD9513-based **Counter/Timer Boards** feature:

- **5, 10, or 20 Counter/Timers** (Qty 1, 2, or 4 AMD9513 chips) w/ Inputs from DC to 7MHz (max); offering Square, Pulse, One-Shot, and Complex outputs.
- **16-bit Counters.** Each 9513 chip provides 5 independent 16-bit counters (65,536 count) which may be chained via software, enabling a **32, 48, 64, or 80-bit** counter to be constructed within the chip. The gate source and gating functions are software-programmable, and may be reconfigured as counter inputs. Chaining across multiple 9513 chips is possible with a single wire, allowing construction of up to **160-bit** counters. Up or down counting may be maintained in **binary or BCD.**
- The ***CyCTM* 05 & 10** has **8 or 16 Digital Inputs** and **8 or 16 High-Current Digital Output Lines (64mA)** to drive Solid-State Relays, LEDs, & Mechanical Relays directly. Includes an on-board **1MHz** Crystal Oscillator & Jumper-Selectable interrupt (IRQ) level.
- Our ***CyCTM* 10H & 20H** feature a **Programmable Clock Source.** Choose from three fully-programmable on-board sources of pulses to the 9513: **External, 1MHz or 5MHz Crystal.** Your choice of PC interrupts IRQ2-IRQ7; interrupts can be used to initiate program execution on terminal count, set off an alarm, or reconfigure counters after a prescribed interval. *(No digital I/O on H models.)*

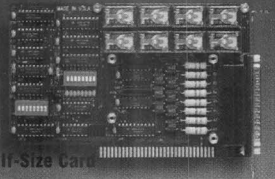
Our ***CyCTM* Series** of Counter/Timer boards are ideally suited for applications where 5, 10, or 20 counters are required, such as: event counting and frequency & pulse output.

Ordering Information: **Fax-on-Demand: FOD#5039**

#**CYCTM 05**	5-Ch. C/T Brd, 8 DIO, 100ppm, 37-pin	$137
#**CYCTM 05X**	High-Accuracy (50ppm) CTM 05	$179
#**CYCTM 10**	10-Ch C/T, 16 DIO, 100ppM, 37-pin	$239
#**CYCTM 10X**	High-Accuracy (50ppm) CTM 10	$279
#**CYCTM 10H**	10-Ch C/T Board, 100ppM, 50-pin	$219
#**CYCTM 10HX**	Hi-Accuracy (50ppm) CTM 10H	$259
#**CYCTM 20H**	20-Ch C/T Board, 100ppM, 50-pin	$359
#**CYCTM 20HX**	Hi-Accuracy (50ppm) CTM 20H	$399

$49 Universal Driver Library (page 60) has support for all DOS & Windows languages. Pp. 64-67 for terminal panels & cables.

CyPDISO 8 8 Mechanical Relays & 8 Isolated Inputs (500V max.)



Half-Size Card

8 Electromechanical Relays:
5 Form C SPDT Relays &
3 Form A SPST Relays
Rated to 28VDC @ 6A with a resistive load, or 120VAC @ 5A (50 to 1,000 Hz)
Operate Time: 20ms • Release Time: 10ms
37-pin D Connector, same pinout as PDISO-8

CyPDISO 16 16 Mechanical Relays & 16 Isolated Inputs (500V max.)

Two 50-pin Headers with a CyPDISO 8 on each!
Functionally similar to the K/M PIO-32I/O
Full-Size Card
To Match Existing KM PDISO-8 Wiring, each 50-pin Header Connector can be Mapped to a 37-pin 'D' with our #CBL 3750 – See page 66.

8 or 16 Isolated Inputs & 8 or 16 Relays, All on 1 Board

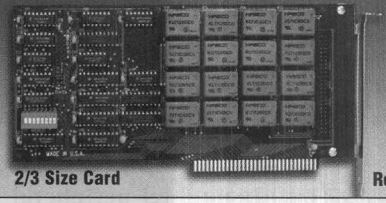
The ***CyPDISO* 8** is a low-cost, 8-channel isolated interface board which allows you to directly connect your PC to AC or DC power lines. It's a **MetraByte-compatible replacement for the PDISO-8**. Isolation voltage is a minimum of 500V channel-to-channel and channel-to-ground. The ***CyPDISO* 8** has one 37-pin connector which carries 8 isolated inputs. Each isolated input has two contacts which are not polarity sensitive and may be mixed between 5 to 24VDC or AC (50-1000Hz). (Not TTL compatible.) Connecting an input is as easy as connecting one side of the contact to pin 1 and the other to pin 2.

Data is written to all 8 relays and read from all 8 inputs as a single byte. Each of the 8 bits per individual byte controls the status of 1 relay or confirms the status of 1 input line. No driver is supplied with the ***CyPDISO* 8**, just use I/O statements included with virtually all programming languages.

The ***CyPDISO 16* is two *CyPDISO* 8**s on one card with two 50-pin connectors. (Each maps to 37-pin with #CBL 3750 cable).

See pages 64-67 for screw terminal panels and cabling options.

CyREL 8 & 16 Qty 8 or 16 Electromechanical Form C SPDT Relays



2/3 Size Card

50-pin Header Connector perfect for Ribbon Cable
Choose 8 or 16 SPDT Form C Relays Rated to 120VAC@5A 28VDC@6A w/Resistive Load,
Operate Time: 20mSec.
Release Time: 10mSec.
Relay Contacts: Gold Overlay Silver

8 or 16 Electromechanical Relays on a PC Card

This relay board saves you the cost of first buying a digital I/O controller and then purchasing a separate terminal panel with mechanical or solid-state relays. The new ***CyREL* 16** has **both the controller and sixteen relays built directly onto the board** to provide you with a **complete, all-in-one package.** Only need 8 relays? Want to save some money? Choose the ***CyREL 8***, a ½-populated version with 8 relays instead of 16.

All 8 or 16 relays are full SPDT Form C. The contacts are rated 5A@120VAC or 6A@28VDC with resistive load. Each channel offers 500VDC isolation between I/O connections and your PC.

Controlling the relays is easy. The 16 relays are addressed as two 8-bit ports. An 8-bit byte is written to either of the two 8-bit output ports (A and B). Each of the 8 bits per individual byte controls the on/off status of 1 relay. Writing a "0" to a bit deactivates that relay, while writing a "1" to a bit activates the relay. No driver is supplied with the ***CyREL* 8** or **16**, as programming is as simple and direct as it can get, just use the I/O statements included with virtually all programming languages.

Ordering Information: **Call for Fax-on-Demand: FOD#5043, 5044, 5051**

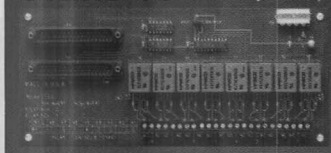
#**CYPDISO 8**	8 Mech. Relays, 8 Isolated Inputs, 37-pin	$147
#**CYPDISO 16**	16 Mech. Relays, 16 Isolated Inputs, 50-pin	$259
#**CYPDISO 8P**	**PCI-bus:** 8 Mech. Relays, 8 Isolated Inputs, 37-pin	$249
#**CYPDISO 16P**	**PCI-bus:** 16 Mech. Relays, 16 Isolated Inputs, 50-pin	$359
#**CYREL 08**	8 Mechanical Relays (Form C SPDT), 50-pin	$119
#**CYREL 16**	16 Mechanical Relays (Form C SPDT), 50-pin	$155

See pages 64-67 for screw terminal panels and cabling options. CAUTION: Use great care when connecting to high voltages. Protective wiring enclosures recommended.

CyberResearch Assistance: Toll-Free 1-800-341-2525 (USA) Tel: 203-483-8815 Fax: 203-483-9024
Applications Engineers: Mon-Fri, 9AM-5PM U.S. Eastern Time • **Internet Website:** http://www.cyberresearch.com • **Fax-on-Demand System:** 203-483-9966 • **BBS:** 203-488-8949

Relay Mtg. Panels Interface Digital I/O to Power

CyERB 08 8 SPDT (Form C) Electromechanical Relay Panel

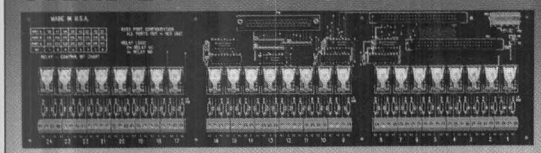


37-pin "D" Connector plus an additional 37-pin "D" Connector for Pass-Through (daisy-chaining) to other accessories

CYERB Series: *8, 24, or 48 SPDT Relays Rated to 28VDC@6A, 120VAC@5A (50-1000Hz)* Operate Time: 20msec. Release Time: 10msec.

9" x 4" Size Card — #CBL MOL10 *Not Required* — Screw Terminals for 12-22 AWG Wire

CyERB 24 24 SPDT (Form C) Electromech. Relay Panel

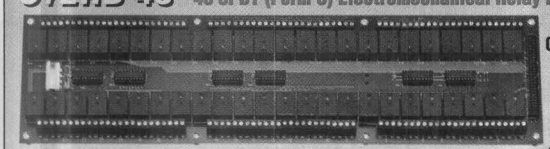


Choose 37-pin "D" or 50-pin Header Connector Input.

A second 50-pin Header passes the other 24 lines of a 48-channel cable to a second CyERB 24.

17" x 4.5" Size Card — +5V Power from PC via #CBL MOL10 cable (included).

CyERB 48 48 SPDT (Form C) Electromechanical Relay Panel

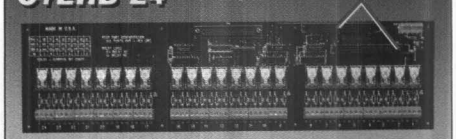


50-pin Header Connector Interfaces easily with 48-line, 50-pin I/O boards, including: *CyDIO* 48, 96, & 192 & *CyDO* 48, 96, & 192

17" x 4.5" Size Card — +5V PC Power via #CBL MOL10 (included).

Each ***CyERB* 08, 24,** or **48** consists of 8, 24, or 48 **mechanical relays.** All relays are SPDT/Form C, with three posts. The center post is COMMON, and is the post which is switched between the other two. One other post is NORMALLY CLOSED, so it is in contact with the COMMON post whenever the ***CyERB*** is powered up, reset, or when 0 is written to the controlling bit of your digital I/O board. The NORMALLY OPEN post is in contact with the COMMON post whenever a 1 is written to the controlling bit of the digital I/O board.

CyERB 24 50-pin Header Connectors



Multiple Panels can be Daisy-Chained to a CyDIO 192 Using one 2-Foot, 50-pin cable #CBL 5002 per panel.

Digital I/O board inputs to the *CyERB* are pulled to a steady state by circuitry on the board, so they will not randomly open or close on power up. The panels can be run from the PC power supply or +5V can be supplied externally (a #CBL MOL10 is included with the *CyERB* 24 & 48 to draw power from your PC – see page 66.)

On-board buffer/drivers allow the *CyERB* 24 to be controlled by any LSTTL or NMOS/CMOS device. Because it compensates for the lack of current sink in such low-power devices, it makes an ideal companion for 8255-type devices such as the auxiliary digital I/O lines on the new ***CyDAS* 1600**. The cost per contact of the ***CyERB* 24** is only **about half that of solid-state relays.**

Ordering Information: **Call for Fax-on-Demand – Index: FOD#3001**

#CYERB 08	Panel w/8 SPDT (Form C) 6A Relays, 37-pin *(ERA-01)*	**$107**
#CYERB 24	Panel w/24 SPDT (Form C) Relays, 37 & 50-pin *(ERB-24)*	**$197**
#CYERB 48	Panel w/48 SPDT (Form C) 6A Relays, 50-pin Connector	**$299**
#INST 1140	5V, 1A Power Supply (plugs into 120V outlet)	**$39**
#CBL MOL10	10-ft Cable, to PC Power Supply (Included w/CYERB 24 & 48)	**$15**
#CBL 3702	2-foot, 37-Conductor Cable	**$25**
#CBL 5002	2-foot, 50-Conductor Cable	**$25**

See pages 64-67 for terminal panels, cables, and wiring schematics. Call for assistance.

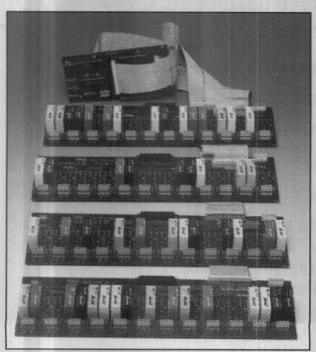
Electromechanical Relays: Ideal Companion for Digital I/O

Electromechanical relays have several advantages over solid-state relays. They are usually less expensive, they are more flexible because they require less current sink from the digital I/O board, and they're smaller, so they can be packaged to take up less space. They have their drawbacks, however. They can arc or surge when used with devices carrying an inductive load (such as motors), and they don't offer the same optical isolation. **Important:** when using *CyERB* for switching inductive loads use the new *CyDO 24 or 48 Output Only* board which cannot be reset by the "inductive kick".

Now Use Opto-22 Relays with TTL-level Digital I/O Lines!

A solid-state relay requires more current to switch on than most Intel 8255-based (TTL-level) digital I/O boards can provide. Output buffer chips built onto our new ***CySSR* 08 & 24** relay mounting racks provide 16mA of current sink per channel. By providing the current sink *on the relay panel*, we've made it possible to use solid-state relays with virtually any TTL-level digital I/O board, whether your digital I/O board provides a sufficiently high current sink or not.

The ***CySSR 8 & 24*** mounting racks can use standard or mini-size Opto 22-style solid-state relays. Each of the 8 or 24 positions can be used to mount a solid-state power control module. Mix and match the input (sensing) and output (relay) modules in 4 or 8-module groups, just as you would when mounting them on our standard **CY PB24** panel. Call for modules & **CY PB** panels.



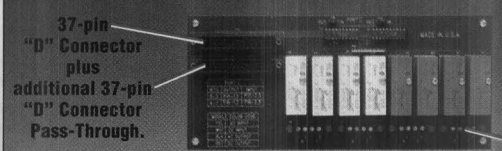
Multiple ***CySSR* 24** Panels can be Daisy-Chained w/50-pin CBL 5002.

Daisy-Chain for Large Point Counts

The ***CySSR* 08** has two 37-pin connectors in parallel,and is wired to Port C of your DIO board. Our ***CySSR* 24** has both 37-pin *and* 50-pin connectors, for easy cabling to most I/O boards. Use the two 50-pin connectors, "IN" and "OUT," to daisy-chain a second **24** panel.

+5VDC power, required to power the rack, can be supplied by your PC's power supply (via the included 10-foot cable with Molex connector **#CBL MOL10**) or by an external supply, such as our **#INST 1140**.

CySSR 08 Mounting Rack: Holds 8 Solid-State Relays (Opto-22/Gordos)



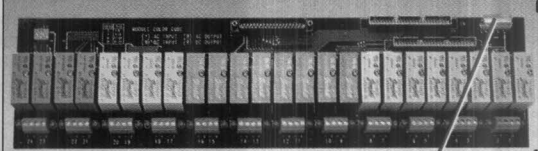
37-pin "D" Connector plus additional 37-pin "D" Connector Pass-Through.

CySSR 08 & *CySSR* 24 Mounting Rack use with Opto-22 Solid-State Relays.

Screw Terminals for 12-22 AWG Wire

9" x 4" Size Card — Indicator LEDs for each Relay

CySSR 24 Mounting Rack: Holds 24 Solid-State Relays (Opto-22/Gordos)



Choose 37-pin "D" or 50-pin Header Connector Input.

A second 50-pin Header Connector passes the other 24 channels of a 48-channel cable to a second CySSR 24.

17" x 4.5" Size Card — +5V Power from PC via #CBL MOL10

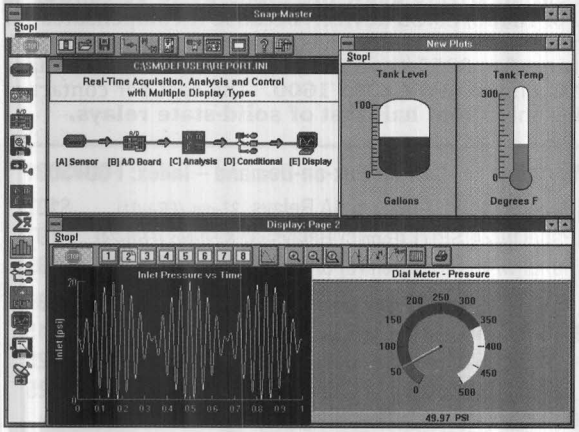
Ordering Information: **Call Fax-on-Demand – Index: FOD#3001**

#CYSSR 08	8-Position TTL-Level Relay Mounting Panel, 37-pin *(SRA-01)*	**$95**
#CYSSR 24	24-Position TTL Relay Mtg. Panel, 37 & 50-pin *(SSIO-24)*	**$149**
#INST 1140	5V, 1A Power Supply (plugs into 120V outlet)	**$39**
#CBL MOL10	10-ft Cable, to PC Power Supply (included w/CySSR 24/48)	**$15**
#CBL 3702	2-foot, 37-Conductor Cable	**$25**
#CBL 5002	2-foot, 50-Conductor Cable	**$25**
#CBL 5006	6-foot, 50-Conductor Cable	**$35**

*Does not include Solid State Modules. See page 64 for cabling schematics.

Call for latest pricing and availability of international versions.

SnapMaster™

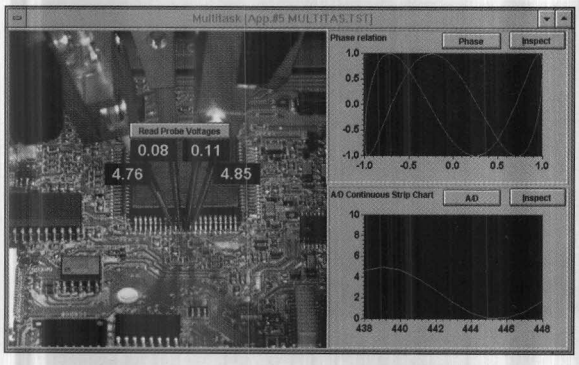


For details request Fax-on-Demand document: **FOD#6019**

Ordering Information:		***Price***
#HDS 200	SnapMaster for Windows Data Acquisition Module	**$995**
#HDS 210	SnapMaster Analysis Module — Time Domain	**$495**
#HDS 220	SnapMaster Analysis Module — Frequency Domain	**$495**
#HDS 270	Data Gateway Toolkit	**$295**
#HDS 280	Front Panel Toolkit	**$295**
#HDS 285S	*Complete SnapMaster Package* — 3 Integrated Modules (Data Acquisition HDS 200, Time Domain HDS 210, & Frequency Domain HDS 220) plus the Front Panel Toolkit HDS 280 **(Save $795)**	**$1485**

Programmer's Development Toolkit: If you plan to use the Dynamic Data Exchange (DDE) features of SnapMaster, consider purchasing the Front Panel Toolkit to make your job easier. The Toolkit module contains source code and example programs for creating custom instrument panels and writing test sequences for SnapMaster. Call for latest pricing and availability of international versions.

TestPoint™



For details request Fax-on-Demand document: **FOD#6029**

Ordering Information:		***Price***
#TP 2000	TestPoint for Windows – Optimized for GPIB/IEEE-488 Applications	**$995**

SEE PAGE 78 for FULL DESCRIPTION

Hardware Requirements: Minimum system requirements for the TestPoint for Windows development and runtime environments are:

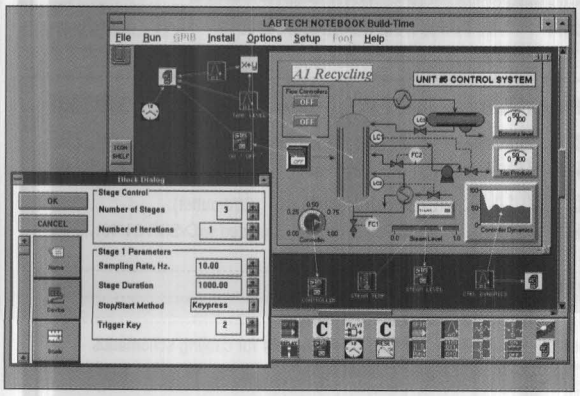
Processor: 80386 or better and Windows 3.1. A more powerful processor will significantly improve the response of Windows, however. TestPoint is designed to accommodate low-cost hardware for production test sites. No math coprocessor is required.

Memory: 4MBytes minimum, 6MB recommended.

Royalty-Free Distribution of RunTime Applications

There are no license fees associated with the applications you create using TestPoint! A runtime packaging utility (accessed from TestPoint's utility menu) puts your test and all related Dynamic Link Libraries (DLLs), INIs and executables into one neat package for distribution.

LABTECH NOTEBOOK & CONTROL™



For details request Fax-on-Demand document: **FOD#6011**

Ordering Information:		Append suffix to part number: ***Capacity***	**–DOS** ***DOS Version***	**–W31** ***Windows 3.1***	**–W95** ***Windows 95***
#LTN 801	NOTEBOOK 10	(100 Blocks)	**$695** (ver 8.11)	**$695**	**$695**
#LTN 802	NOTEBOOK*pro* 10	(300 Blocks)	**$1195** (ver 8.11)	**$1195**	**$1195**
#LTC 501	CONTROL 10	(600 Blocks)	**$2495** (ver 5.11)	**$2495**	**$2495**
#LTC 502	CONTROL*pro* 10	(2000 Blocks)	**$3495** (ver 5.11)	**$3495**	**$3495**

Windows versions of NOTEBOOK*pro*, CONTROL, and CONTROL*pro* support Realtime Remote™, a new feature allowing you to take advantage of the latest technology. Realtime Remote™ allows you to monitor data in real time from other copies of the software at remote locations, either locally via a TCP/IP LAN, or worldwide via an internet web browser. Real-Time **VISION** or **VISION*pro***, operator interface for graphical depiction of data and on-screen object graphic animation, included free with Windows 3.x and Windows 95 versions of Notebook, Notebook*pro*, Control, or Control*pro*.

Includes: Software on 3.5" diskettes with CyberResearch driver set.

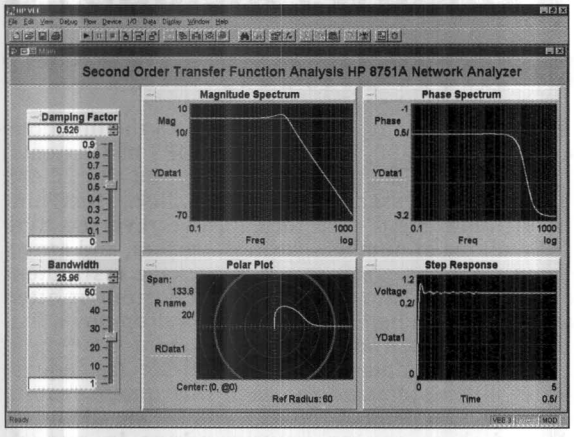
Quantity and academic discounts available. Training sessions & extended support also offered.

CyberResearch Assistance: Toll-Free 1-800-341-2525 (USA) ☎ **Tel: 203-483-8815 Fax: 203-483-9024**

Applications Engineers: Mon-Fri, 9AM-5PM U.S. Eastern Time • **Internet Website:** http://www.cyberresearch.com • **Fax-on-Demand System:** 203-483-9966 • **BBS:** 203-488-8949

HP VEE Data Acquisition Software

For details request Fax-on-Demand document: FOD#6035



Designed by Hewlett-Packard, HP VEE is a powerful visual programming language. To develop programs in HP VEE, you connect graphical "objects" instead of writing lines of code. Your programs become "virtual instruments" which resemble easy-to-understand block diagrams, with lines showing data flow.

Comprehensive libraries of advanced data analysis functions make it easy to use your own formulas or use the built-in HP Vee formula icons. HP VEE supports PC plug-in boards, serial, GPIB/IEEE-488, & VXI*plug&play*. (See pg. 61).

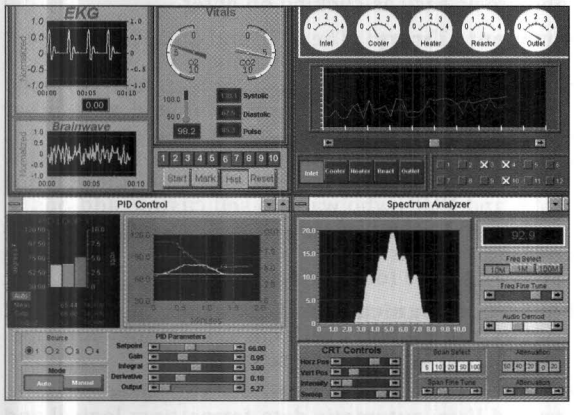
Ordering Information: *(See page 61 for more info).* ***Call for information on University Discounts.***

#HPV W31F HP VEE 3.1 Graphical Engineering Software for Windows 3.1, 3.5" Floppies ..**$995**
#HPV W95D HP VEE 4.0 Software for Windows 95 & Windows NT, on CD-ROM.....**$1295**
#HPV W95F HP VEE 4.0 Software for Windows 95 & NT, on 3.5" Floppies (includes CD-ROM)...**$1395**
#HPV W95U HP VEE Software Upgrade to Windows 95 & Windows NT Version on CD **$695**
(Each package includes full HP VEE software system and helpful user documentation. Discounts on qty. 5+)

#PREN HPV1 Book: **Visual Programming with HP VEE,** Robert Helsel.....**$35**

Scientific Analysis and Graphing Software

For details request Fax-on-Demand document: FOD#6032



Ordering Information:

Real-Time Graphics Tools For Windows (Includes Charting Tools)

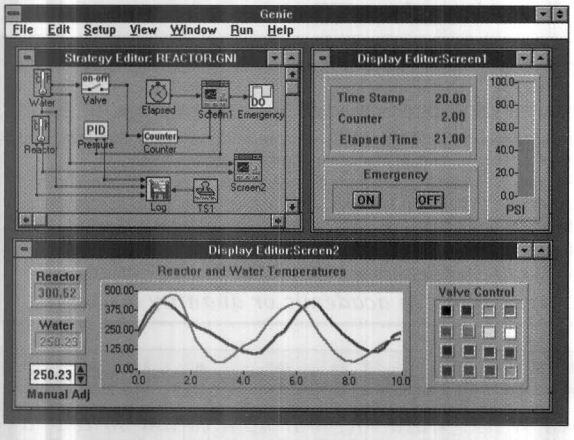
#QCS 310 Real-Time Graphics Tools for Windows C (DLL Library).....**$595**
#QCS 350 Real-Time Graphics Tools for Windows C (DLLs & Source Code).....**$1195**
#QCS 311 Real-Time Graphics Tools for Windows Visual Basic (DLL Library).....**$495**
#QCS 351 Real-Time Graphics Tools for Windows Visual Basic (DLLs & Source Code).....**$1095**

Charting Tools For Windows

#QCS 210 Windows Charting Tools for C (DLL Library).....**$295**
#QCS 250 Windows Charting Tools for C (DLLs & Source Code).....**$595**
#QCS 211 Windows Charting Tools for Visual Basic (DLL Library).....**$295**
#QCS 251 Windows Charting Tools for Visual Basic (DLLs & Source Code).....**$595**

GENIE™

For details request Fax-on-Demand document: FOD#6017



Ordering Information: ***SEE PAGE 51 FOR MORE INFORMATION*** ***Price***

#PCL GENIE Complete *GENIE* Software Package.....**$695**
#PCL GENLT *GENIE LITE* Software Package.....**$395**

GENIE software is ideal for use with the CyberResearch PCL 720, PCL 722, PCL 724, PCL 727, PCL 728, PCL 812G, PCL 818H, PCL 818HG, and PCL 818LC boards, and the ADAM-Series Modules (see page 7B).

Special Package Pricing

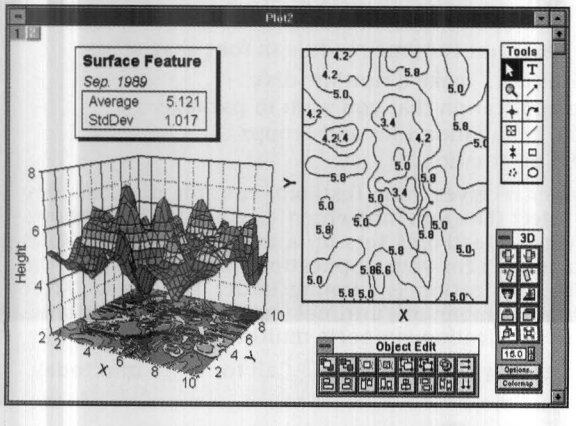
#PCL 818LCP PCL 818LC Complete Package with *GENIE LITE* (page 51).....**$495**
Includes: PCL 818LC Data Acquisition Board, Terminal Panel, & Genie Software.

#PCL 812GCP PCL 812G Complete Package with *GENIE LITE* (page 51).....**$795**
Includes: PCL 812G Data Acquisition Board, Terminal Panel, & Genie Software.

See our 204-page *PC Systems Handbook* for additional details on PCL boards, and ADAM-series Modules.

ORIGIN™

For details request Fax-on-Demand document: FOD#6027



Ordering Information: ***Price***

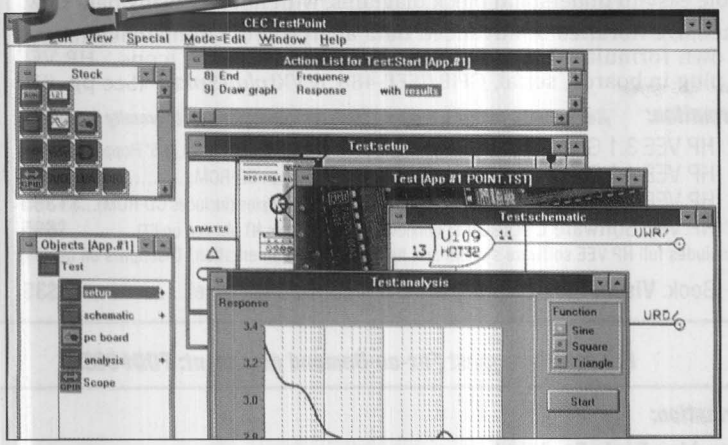
#MCO 2000 Origin Data Acquisition System Package.....**$1245**
Origin Software with LabData, 3D, RTM, UIM, LabGPIB and LabCOM Modules

#MCO 1674 Origin, LabData, RTM, and UIM Package.....**$900**
#MCO 1678 Origin, LabGPIB, and UIM Package.....**$660**

#MCO 1360 Origin Scientific Graphing & Data Formatting Software.....**$495**
#MCO 1370 Origin Software with 3D & Contour Package.....**$545**

#MCO 1390 3D & Contour Module (3D).....**$125**
#MCO 1694 User Interface Module (UIM).....**$195**
#MCO 1692 Real-Time Module (RTM).....**$245**
#MCO 1398 Peak Fitting Module (PFM).....**$350**
#MCO 1392 Axon pCLAMP Module.....**$75**
#MCO 1414 File Utilities Module (FUM).....**$110**

TestPoint™ for Windows includes a Free Universal Instrument Library



TestPoint is a new Windows programming environment which provides advanced performance features at no extra cost:

- **GPIB/IEEE-488:** The best instrument support on the market
- **Data Acquisition:** Multitasking A/D, D/A, Digital I/O
- **Universal Instrument Library:** Provides 100s of objects
- **Versatile Graphing:** With static, strip chart, & X vs. Y graphs
- **DDE:** Allows you to control and exchange information with word processors, spreadsheets, and databases
- **Open System:** Advanced programming features without programming tedium

TestPoint is a new tool for designing and developing test, measurement, and data acquisition applications for Windows. TestPoint builds applications quickly without forcing you to become a Windows programmer. TestPoint lets you build complete applications without drawing, connecting, or wiring icons, or writing lines of code. TestPoint's approach is easier because it is a natural extension and compliment to the way you design. We've found that most software begins as a pencil and paper sketch outline, a list of things needed for the test and a list of things the test should do. TestPoint takes those simple but time-proven and intuitive ideas and puts them to work on your computer. You simply place graphs, displays, data entry fields and the other interactive parts of your test on a display panel — order isn't important. Place them as you think of them. Then list the things the test should do by placing objects in an Action List. While you select the objects you need, TestPoint builds both the code to run the test and a description of the test for you. Typing is almost eliminated since you can select, drag, & drop the variables and parameters you need.

IEEE-488, RS-232, & RS-485: TestPoint supports all the functions and commands of all IEEE-488, RS-232, and RS-485 instruments. Data transfer, serial & parallel polling, triggering, and all IEEE-488 commands are easily accessed with a single click. TestPoint converts difficult instrument data formats like reversed byte binary, or combinations of numbers, strings, vectors, and arrays with simple menu options. You can also package instrument commands of your choice into an icon so that custom or often used commands are immediately available as a drop-down list. Special requirements like individual instrument time-outs, custom input and output data delimiters, and service request interrupts are easily customized for each instrument from a checklist. All of the functions of the IEEE-488 (HP-IB, GPIB) bus are available and there are **no compromises in speed.** Using our INST 2001 card (page 79), sustained data rates over 1 MByte/second are as easy as clicking on enter.

Universal Instrument Library: The GPIB and RS-232 instrument objects in TestPoint support all instruments, all functions, and all commands. These general-purpose objects can be used directly or they can be customized and combined with other objects. Custom objects can be saved under their own icon for future use and they can be distributed as stand-alone items. The details of custom objects can be hidden or "locked" for designers, OEM's, and VAR's who want to sell custom add-ons to TestPoint. In addition to the general purpose objects, TestPoint provides hundreds of instrument-specific objects (such as a generic Digital Multi-Meter) for your convenience.

RS-232/485 Serial Communications Functions: A drop-down list supports up to 9 serial ports with custom settings for time-outs, I/O delimiters, queue size, and event signals.

Standard and Advanced Mathematics: Supports: scalars, vectors, arrays and lists; automatic data formatting; logical and string operators; algebraic and trigonometric functions; exponentiation and logarithms; FFTs; Inverse FFTs; etc.

Ordering Information: *Call Fax-on-Demand for info 203-483-9966:* ***FOD# 6029***

#TP 2000 TestPoint Software for Win 3.x Windows 95, & Windows NT...**$995**

Hardware Requirements: Minimum system requirements for the TestPoint for Windows development and runtime environments are:

Processor: 80386 and Windows 3.1. A more powerful processor will significantly improve the response of Windows, however. TestPoint is designed to accommodate low-cost hardware for production test sites. No math coprocessor is required.

Memory: 3 MBytes minimum, 4 MB recommended.

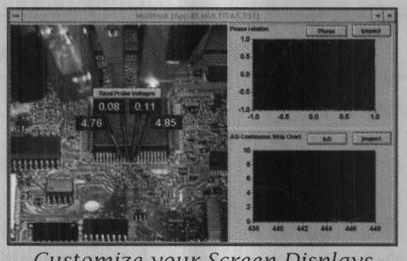
Disk Space: 2 to 7 MegaBytes, depending on options selected during installation.

Call to receive a quote on academic or quantity discounts.

Attention VARs & OEMs: TestPoint allows Royalty-Free Distribution of RunTime Applications!

TestPoint provides you with unequaled value and performance for your production applications.

There are no license fees associated with the applications you create using TestPoint!



Customize your Screen Displays with Annotated Photos & Graphics

A **runtime packaging utility**, accessed from TestPoint's utility menu, puts your test and all related Dynamic Link Libraries (DLLs), INIs, and executables into one neat package for distribution. The packaging utility also includes a Windows installation program that installs your application and automatically puts your application icon into its own program manager group. Our free *PC Systems CD* of software demos includes a function generator written in TestPoint.

TestPoint does all the work for your application so that it installs just like a professional off-the-shelf package. Our advanced file compression utility fits most applications and the TestPoint files on one diskette.

Package your TestPoint runtime module in four easy steps:

1.) Choose Utilities... make a runtime disk.
2.) Select the application that you want to package.
3.) Choose the installation files and groups.
4.) Choose the destination.

When a customer receives your TestPoint runtime disk, all they need to do is select "File Run" and enter "a:setup" in the Windows program manager. TestPoint sets up a new group and installs the software and icon for your application. Double-click on the icon, and your application is running under Windows. After installation, any number of runtimes can execute simultaneously, and each application supports multi-tasking.

TestPoint is fast, easy, & professional. Call for more info today.

CyberResearch Assistance: Toll-Free 1-800-341-2525 (USA) ☎ **Tel: 203-483-8815 Fax: 203-483-9024**
Applications Engineers: Mon-Fri, 9AM-5PM U.S. Eastern Time • **Internet Website:** http://www.cyberresearch.com • **Fax-on-Demand System:** 203-483-9966 • **BBS:** 203-488-8949

GPIB/IEEE-488.2 Software-Compatible with NI™ & HP™

Money-Saving Replacements for both National Instruments® and Hewlett Packard® GPIB (IEEE-488.2) Boards

The INST 2000 Series includes drivers which are *Software Compatible* with both old and new NI GPIB and HP-IB interfaces. Software compatibility with your existing source code saves you conversion time. In addition, we supply drivers which are compatible with virtually all industry-standard software packages, including: **LabVIEW**® (for Win95 & Win3.x), **LabWindows**® CVI, Labtech Notebook™, TestPoint™, SnapMaster™, DASY*Lab*, & HP ITG.

The INST 2000 family has been designed to support all IEEE-488 devices (488.1, 488.2, HP-IB, & GPIB) to ensure significant compatibility with the source code you have already written. Both small and large blocks of data are handled efficiently with only the most minimal delays due to software overhead.

High-Performance 16-Bit GPIB board is Only $395

The **INST 2001** (ISA-bus) and **INST 2020** (PCI-bus) are high-performance IEEE-488 interface and controller cards. They can transmit and receive 64 KByte arrays at up to **1.5 MB per second** (5 MB per second using IEEE-488 streaming data protocol). Both are well-suited for applications requiring high-speed transfer of data.

At just $295, our **INST 2002** 8-bit board was designed for use in any ISA/EISA bus PC for low-speed data transfer. It can transmit and receive up to 64 KByte blocks of data at up to **350 KB/second**.

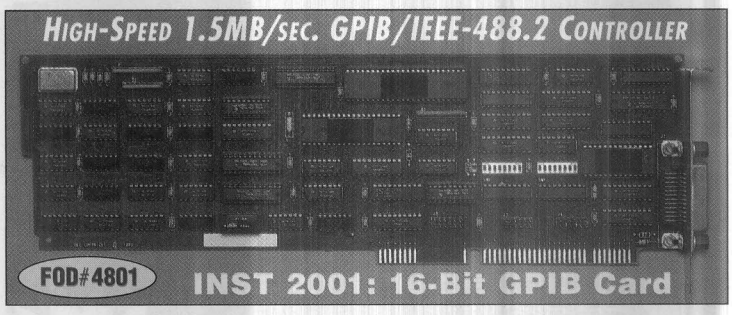
Ordering Information: **Call Fax-on-Demand for info: FOD#4801 & 4802**

#INST 2001 16-Bit High-Performance GPIB/IEEE-488.2 Board...**$395**
#INST 2020 PCI-Bus High-Performance GPIB Board.....**$395**
#INST 2002 8-Bit Standard GPIB Controller Board.....**$295**
#TP 2000 TestPoint Software (page 78) for Windows, Win95, & NT.....**$995**

GPIB Software for DOS & Windows 3.x/95/NT included w/each board.

Each INST 2000-series board includes: a user's manual, tutorial, software library with source code, example programs, and support for all IEEE-488 / GPIB instruments and peripherals.

National Instruments®, LabVIEW®, & LabWindows® are trademarks or trade names of National Instruments Corporation.



FREE Software

Our INST 2000 boards include comprehensive programming support for a wide variety of languages. Most versions of BASIC, C, Pascal, & Fortran are supported for DOS. A Windows 3.x DLL is included, along with MS Windows support for Borland C++, C for Windows, HP Instrument BASIC, Turbo Pascal, and Visual Basic (with IEEE-488 module). **Includes 32-bit DLLs for Windows 95 & NT.**

Tools to support four fast and easy-to-use additional programming methods are also included:

Linkable subroutines — provides stand-alone applications without requiring a driver or changes to CONFIG.SYS (ideal for when you want to distribute the code to multiple computers).

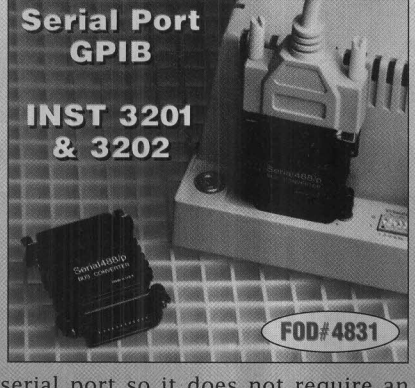
File I/O — sets up an IEEE-488 device so that it looks like a PC file. Then you just read it and write to it like a file.

Firmware — the most compact code.

Universal Language Driver — looks like HP BASIC and works with all languages.

TestPoint is an advanced menu-driven software package which has been specifically tailored to support our INST 2000 GPIB boards. With a full complement of GPIB functions available to the user WITHOUT PROGRAMMING, TestPoint provides a user-friendly interface for data acquisition and analysis of data from IEEE-488 devices, along with support for many PC board-level DAS & I/O products.

Serial-Port GPIB Miniature Controller & Converter



The CyberResearch **Miniature INST 3201** is the smallest serial to IEEE-488 controller on the market. It features an on-board microcontroller which enables it to interpret commands received on the serial port to control up to **eight IEEE-488/GPIB instruments**. Some application limitations apply (i.e. no parallel polling or binary data transfers). The unit is powered from the PC's serial port so it does not require an external power supply. It has DB-25 & IEEE-488 connectors.

With the **INST 3202 Miniature Serial Converter** you can **control one IEEE-488** (HPIB, GPIB) printer or plotter from any PC **via the RS-232 COM port.** Just connect the INST 3201 to the IEEE-488 interface on the printer or plotter, then attach a serial cable from the computer. It operates transparently, so no software modification on the host computer is necessary. It automatically converts serial data from the host into IEEE-488 data for the peripheral. Fixed settings meet most applications.

#INST 3201 Mini Serial/IEEE-488 Controller, Qty 8 Instruments Max.....**$395**
#INST 3202 Mini Serial/IEEE-488 Converter, Qty 1 Printer/Plotter.....**$295**

INST 3200 Miniature Converter/Controller Modules include manual and software.
See page 82 for GPIB cables and cabling accessories.

Parallel-Port GPIB Printer/Plotter Combo-Cable™

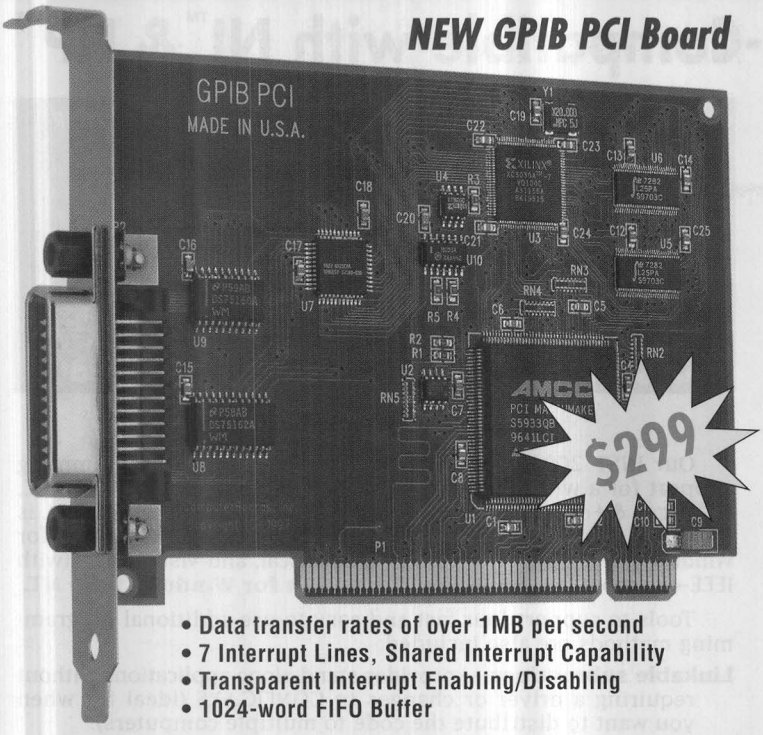
When all you need to do is print or plot from your PC to an IEEE-488 (GPIB) printer or plotter, the **INST 2301** Combo-Cable™ enables you to **save an expansion slot *and* save the cost of an IEEE-488 interface card** & cable. Advanced applications are described with detailed examples in the user's manual. If you can print it or plot it, the INST 2301 will work.

The Combo-Cable is fast, it installs in seconds, and it's so simple that **no programming is needed**. Just connect one end of the Combo-Cable to any parallel port and the other end to the IEEE-488 connector on your printer or plotter. The software driver is only 3.5KB, and can be loaded into high memory. Enter just one command at the DOS prompt & you're ready to go. You can use any **one parallel port to control up to 3 IEEE-488 peripherals.** You can send data to any device at any address, and you can continue to use your print spooler for long printouts. The Combo-Cable features multiple shields for high noise immunity, zinc-plated metal header for durability, gold contacts for reliability, and integral strain relief. 100% Satisfaction Guaranteed.

#INST 2301 Combo-Cable™: Parallel Port to IEEE-488; Qty 3 Peripherals max...**$195**

Compes complete and ready-to-use. The INST 2301 Combo-Cable includes a user's manual, software, and a 2-meter (6-foot) cable with built-in GPIB interface.

NEW GPIB PCI Board



- Data transfer rates of over 1MB per second
- 7 Interrupt Lines, Shared Interrupt Capability
- Transparent Interrupt Enabling/Disabling
- 1024-word FIFO Buffer

New GPIB Cards for PCI, PCMCIA, PC/104, & ISA-bus Slots

The latest expansion bus for personal computers is the **PCI** (**P**eripheral **C**omponent **I**nterface) **bus.** The PCI bus is MUCH faster than older ISA-bus expansion slots, and can handle data transfers at rates of 150 megabytes per second or more. Most PC systems now come with PCI expansion slots, so we've developed a GPIB card compatible with the PCI bus architecture.

Users who are tight on space or are looking for portable systems should consider our GPIB models for PCMCIA or PC/104 (shown on the facing page). As always, we are proud to offer traditional ISA-bus cards. Two brand-new IEEE-488.2 models round out our GPIB card offerings, a low-cost model for 8-bit (XT) expansion slots (pictured below), and a high-speed model (shown at right) built for 16-bit (AT) expansion slots.

The GPIB PCI Solution – Easy to Set Up & Easy to Use

Designed for use in the latest PCI-bus computer systems, our new **GPIB PCI** board provides full IEEE-488.2 compatibility with data transfer rates in excess of 1 million bytes per second.

An on-board 1024-word FIFO buffer makes it easy to control and gather data from up to 14 instruments using a single card. This is a complete talker/listener/controller, on a compact, short-slot PCI bus interface card. An industry-standard shielded GPIB connector makes it easy to use standard GPIB cables (page 82).

The GPIB PCI is a true Plug-&-Play card: no switches, no jumpers — just plug it in, run the installation software, and start communicating. Base address and interrupts are set automatically. High-speed data transfers are accomplished using the REP INSW command instead of the older DMA method.

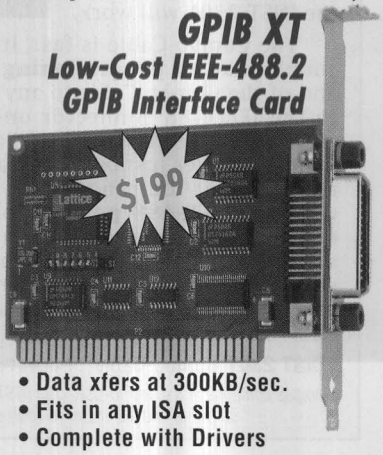
Full support is provided for Windows 95, Win3.x, and DOS. The installation software will help manage resources for you on non-Plug & Play systems.

Other GPIB PCI specs:

Data Xfers:	>1MByte per second
Power Req:	5VDC @ 375mA typ.
Dimensions:	5.26" x 3.8"
Operating:	0 to 60°C (32 to 140°F)
Humidity:	10 to 90%
Storage:	–40 to 100°C, 5-90% R.H.

Comes with full GPIB software library.

GPIB XT
Low-Cost IEEE-488.2 GPIB Interface Card



- Data xfers at 300KB/sec.
- Fits in any ISA slot
- Complete with Drivers

GPIB AT & GPIB PC104 – One Switch, No Jumpers

Designed around the same IEEE-488.2 chip as our PCI model, the **GPIB AT** (shown below) is perfect for use in any standard 16-bit ISA (AT) expansion slot. Like the PCI card, it has a 1024-word FIFO buffer, and **comes with our complete GPIB library** of software routines. Software drivers for LabVIEW (pg. 60) are just $49.

Extremely easy to install and use, the GPIB AT card has just one switch – to select the base address of the card. The installation software then automatically configures hardware interrupts.

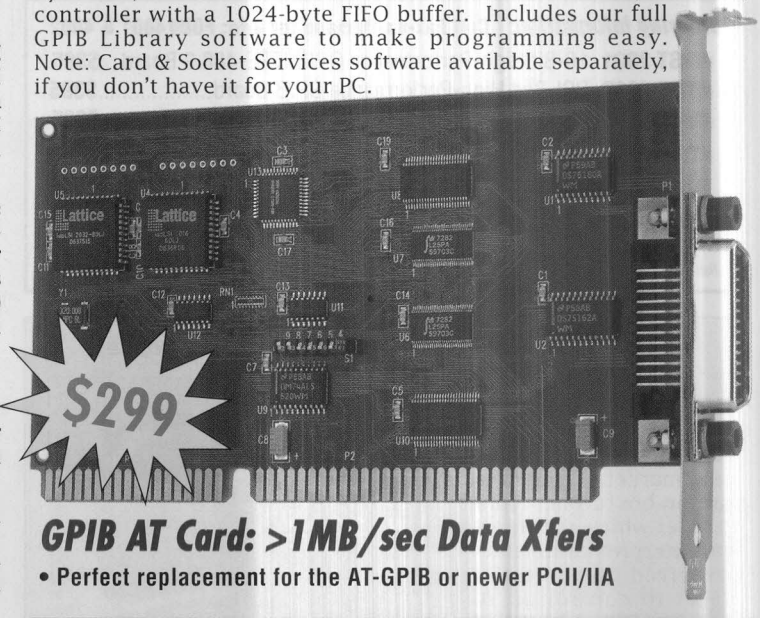
Our PC/104 model (shown on the facing page) offers the same features in a compact industrial PC/104 module. A full 16-bit card, the **GPIB PC104** handles data transfers at over 1MB/second.

XT Model Delivers Lowest-Cost GPIB Solution

Similar to the GPIB AT, our new GPIB XT is a full IEEE-488.2 controller/talker/listener which plugs into any 8-bit or 16-bit ISA expansion slot. At $199, it is our least expensive GPIB solution. The GPIB XT can handle data transfers of over 300KBytes/second. It has six interrupt lines, shared interrupt capability, and DMA (Direct Memory Access) to provide peak performance in an 8-bit card. Best of all, it **comes with the full GPIB Library software** driver package provided with all the boards on these two pages.

PCMCIA (PC-Card) Model provides Portable High Performance

Finely crafted into a Type II PCMCIA card (just 5mm thick!), our **PCY GPIB** is closest to our GPIB PCI, offering high-speed data transfers at **over 1MB/sec.** Perfect for portable PCs and mobile systems, the PCY GPIB is a full IEEE-488.2 talker/listener/controller with a 1024-byte FIFO buffer. Includes our full GPIB Library software to make programming easy. Note: Card & Socket Services software available separately, if you don't have it for your PC.



GPIB AT Card: >1MB/sec Data Xfers

- Perfect replacement for the AT-GPIB or newer PCII/IIA

GPIB/IEEE-488 History

The communications standard we know as GPIB was developed at Hewlett Packard (HP), and was originally known as the HP-IB (Hewlett Packard Interface Bus). Many people still associate the interface with Hewlett Packard, and HP is still a major supplier of GPIB-compatible instruments & plotters.

As this high-speed method of communicating with instruments became more popular, the name was gradually changed from HP-IB to **GPIB** (**G**eneral **P**urpose **I**nterface **B**us). Eventually it was codified by the IEEE (**I**nstitute of **E**lectrical & **E**lectronics **E**ngineers) as IEEE Standard #IEEE-488. In recent years, this standard was expanded to the full IEEE-488.2 standard in use today.

The GPIB interface cards on these and the previous pages meet the **IEEE-488.2** hardware standards. Our INST 2000 series (prev. page) supports the latest software standard, **SCPI** (**S**tandard **C**ommands for **P**rogrammable **I**nstruments). SCPI goes beyond IEEE-488.2 by defining software & hardware standards, **eliminating a major problem with the IEEE-488 communications standard:** the lack of command uniformity between instruments.

CyberResearch Assistance: Toll-Free 1-800-341-2525 (USA) Tel: 203-483-8815 Fax: 203-483-9024
Applications Engineers: Mon-Fri, 9AM-5PM U.S. Eastern Time • **Internet Website:** http://www.cyberresearch.com • **Fax-on-Demand System:** 203-483-9966 • **BBS:** 203-488-8949

GPIB Driver Library – FREE with our GPIB Boards

A Language Library for Windows 3.1, Windows 95, Windows NT, and DOS

The GPIB Library software allows you to create application programs to utilize our GPIB boards. The GPIB Library is a complete library of routines for GPIB communication and control. It is written in x86 assembler and C, with language interfaces for:

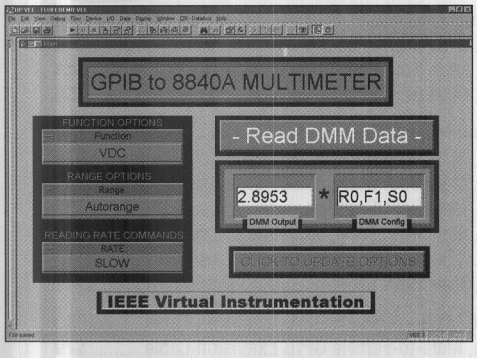
MS Windows	MS DOS	Borland Windows	Borland DOS	Others
Visual Basic	QB 4.5	Borland C++	Turbo Pascal 6+	HP-VEE®
Visual C/C++	QuickC	Delphi	Turbo C/C++	**NI LabVIEW®**
QuickC for Win	Visual BASIC for DOS		Borland C++	Watcom C++
MicroSoft C	Professional BASIC 7.0			Tek. Wavestar®
				HP BenchLink

If you need support not listed here, call us – we are continuing driver development & testing.

Driver Software is National Instruments® NI-488.2® Compatible

The syntax of the GPIB Driver Library routines is identical to the syntax used by National Instruments in the current NI-488.2 programmer's library and in their earlier Driver488® software.

There are two ways you can use the GPIB Library — you may run your existing compiled programs using our compatible DLL in place of the NI version, or you may re-compile your programs to run with the GPIB Library DLL.



General Overview

The GPIB Library is composed of many different routines, and is in fact two quite different and complete GPIB Libraries. Each of these libraries is modeled on the corresponding National Instruments library. Routines whose name begins with "IB" or "IL" are part of the original NI GPIB library, while the remaining routines are part of the newer 488.2 library. These software routines allow you complete control of the operations of the GPIB bus. In most applications, you will only need a few of the available routines to accomplish your task.

Example Programs Included

A complete set of example programs is included for C, Basic, Visual Basic, Pascal, and Delphi for both DOS & Windows languages to clarify the use of each GPIB Library function.

NI-488.2 Compatibility

The GPIB Library is compatible with the NI-488.2 library on two levels. First, the two libraries are syntactically and functionally identical. This means that any program written for the NI-488.2 library may be recompiled for the GPIB Library – and it will compile, run, and function without error exactly the way it did when compiled and run with the NI software.

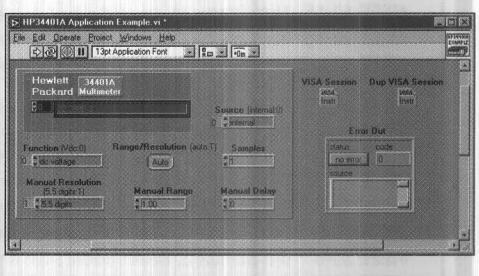
The second level of compatibility is binary, or DLL compatibility. As of this writing, it is possible to swap the GPIB Library DLL for the NI-488.2 DLL and run programs already compiled for the NI DLL, using one of our GPIB boards. Using our HP-VEE interface, HP-VEE thinks it's talking to an NI board! Should NI modify the calls for their boards in the future, simply re-compile your programs, and they will work.

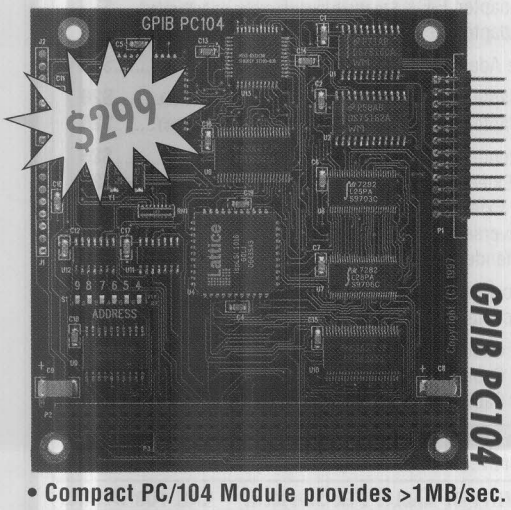
The LabVIEW Library

LabVIEW support for all our GPIB-series (including the PCY GPIB) is included for FREE with each board. The LabVIEW Library is part of our GPIB library, so you can begin using all the GPIB Library functions from within LabVIEW immediately.

All the GPIB Library functions are included as LabVIEW programming blocks, along with several example programs to get you started. Everything currently supported by the GPIB Library under Windows is supported by the LabVIEW interface.

If you have purchased LabVIEW, this library provides complete support for GPIB/IEEE-488. If you do not own a copy of LabVIEW you should take a good look at HP-VEE before purchasing one. HP-VEE is faster, it has more functions than LabVIEW, and HP-VEE is backed by the first name in measurement: Hewlett-Packard (see pg 61). It also costs less, & the GPIB drivers are free.





- Compact PC/104 Module provides >1MB/sec.
- Just one switch, no jumpers – easy to set up!

Ordering Information: **Call Fax-on-Demand for info 203-483-9966: FOD#4820**

#GPIB PCI	High-Speed IEEE-488.2 Controller Card for PCI Bus, w/GPIB Library Software.....	**$299**
#GPIB AT	High-Speed IEEE-488.2 Controller Card for ISA/AT Bus, w/GPIB Library Softw	**$299**
#GPIB XT	IEEE-488.2 Controller Card for ISA/XT or AT Bus, with GPIB Library Software	**$199**
#GPIB PC104	High-Speed IEEE-488.2 Controller PC/104 Module, with GPIB Library Software.....	**$299**
#PCY GPIB	High-Speed IEEE-488.2 Controller PCMCIA Card (PC-Card), w/GPIB Library	**$299**
#HPV W95D	HP-VEE 4.0 Software for Windows 95 & Windows NT, on CD-ROM (see pages 61 & 77)..	**$1295**
#CSS SOFT	Card & Socket Services Software, for PCY GPIB only (not always needed)	**$25**

Our extensive line of GPIB Cables and Cabling Accessories is detailed on the next page.

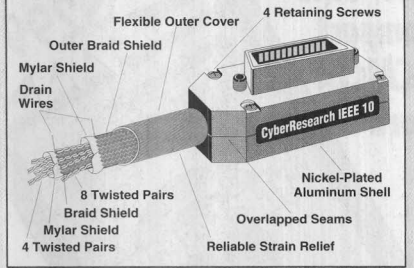
CyberResearch™, GPIB AT™, GPIB XT™, GPIB PCI™, GPIB PC104™, PCY GPIB™, and GPIB ULV are trademarks or trade names of CyberResearch, Inc. All rights reserved. LabVIEW®, National Instruments®, NI-488®, NI-488.2™, and Driver488® are registered trademarks or trade names of National Instruments. All other trade names are property of their respective holders.

QUANTITY DISCOUNTS: 1-4: LIST 5-9: 5% 10-24: 10% 25-49: 15%
DISCOUNTS APPLY TO QUANTITY OF GPIB BOARDS OR ANY SINGLE ITEM PER SHIPMENT • CALL FOR DETAILS

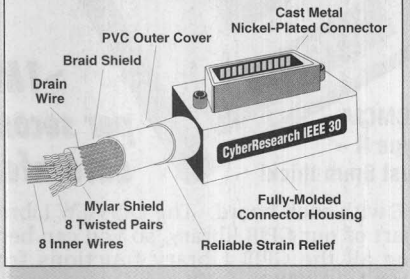
GPIB/IEEE-488 Cabling

Cabling is a small part of the cost of your system, yet it's the critical link which ensures data integrity. Why not get the best? Our premium cables cost less than others' standard cables.

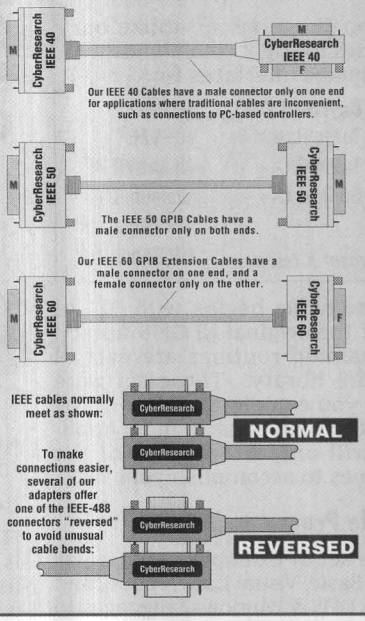
IEEE 10 Premium GPIB Cable

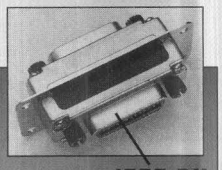


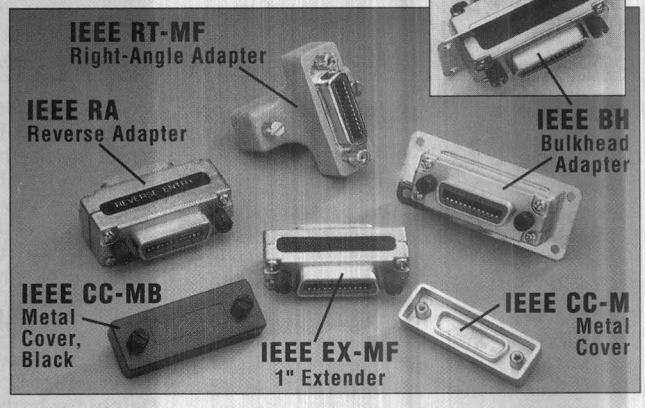
IEEE 30 Standard GPIB Cable



Special-Ended GPIB Cables







Ordering Information: **Call CyberResearch Fax-on-Demand 203-483-9966 for detailed product info, 24 hours a day** **FOD#4810**

IEEE-488 Shielded Cables (Reverse connectors & other styles available – call.)

#IEEE 10-03	0.3m Premium, Double-Braided & Double-Shielded 1.09 ft GPIB Cable	$79
#IEEE 10-05	0.5m Premium, Double-Braided & Double-Shielded 1.64 ft GPIB Cable	$89
#IEEE 10-1	1m Premium, Double-Braided & Double-Shielded 3.28 ft GPIB Cable	$95
#IEEE 10-2	2m Premium, Double-Braided & Double-Shielded 6.56 ft GPIB Cable	$99
#IEEE 10-25	2.5m Premium, Double-Braided & Double-Shielded 8.20 ft GPIB Cable	$105
#IEEE 10-3	3m Premium, Double-Braided & Double-Shielded 9.84 ft GPIB Cable	$109
#IEEE 10-4	4m Premium, Double-Braided & Double-Shielded 13.12 ft GPIB Cable	$115
#IEEE 10-5	5m Premium, Double-Braided & Double-Shielded 16.40 ft GPIB Cable	$125
#IEEE 10-6	6m Premium, Double-Braided & Double-Shielded 19.68 ft GPIB Cable	$135
#IEEE 10-8	8m Premium, Double-Braided & Double-Shielded 26.24 ft GPIB Cable	$149
#IEEE 10-10	10m Premium, Double-Braided & Double-Shielded 32.80 ft GPIB Cable	$165
#IEEE 10-12	12m Premium, Double-Braided & Double-Shielded 39.36 ft GPIB Cable	$179
#IEEE 10-15	15m Premium, Double-Braided & Double-Shielded 49.20 ft GPIB Cable	$205
#IEEE 10-18	18m Premium, Double-Braided & Double-Shielded 59.04 ft GPIB Cable	$229
#IEEE 10-x-B	*Option:* "No Glare" **Black Cable & Connectors**, 1.0m to 6.0m lengths only	$10
#IEEE 30-05	0.5m Standard, Molded, Braided Shield GPIB Cable	$55
#IEEE 30-1	1m Standard, Molded, Braided Shield GPIB Cable	$59
#IEEE 30-2	2m Standard, Molded, Braided Shield GPIB Cable	$63
#IEEE 30-3	3m Standard, Molded, Braided Shield GPIB Cable	$69
#IEEE 30-4	4m Standard, Molded, Braided Shield GPIB Cable	$74
#IEEE 30-5	5m Standard, Molded, Braided Shield GPIB Cable	$79
#IEEE 30-6	6m Standard, Molded, Braided Shield GPIB Cable	$85
#IEEE 30-8	8m Standard, Molded, Braided Shield GPIB Cable	$95
#IEEE 40-05	0.5m Standard, Male-Ended at One End, Molded, Braid & Shield	$47
#IEEE 40-1	1m Standard, Male-Ended at One End, Molded, Braid & Shield	$49
#IEEE 40-2	2m Standard, Male-Ended at One End, Molded, Braid & Shield	$56
#IEEE 40-4	4m Standard, Male-Ended at One End, Molded, Braid & Shield	$69
#IEEE 41-05	0.5m Premium, Male-Ended, Double-Braided & Shielded GPIB Cable	$79
#IEEE 41-1	1m Premium, Male-Ended, Double-Braided & Shielded GPIB Cable	$85
#IEEE 41-2	2m Premium, Male-Ended, Double-Braided & Shielded GPIB Cable	$95
#IEEE 41-3	3m Premium, Male-Ended, Double-Braided & Shielded GPIB Cable	$103
#IEEE 41-4	4m Premium, Male-Ended, Double-Braided & Shielded GPIB Cable	$111
#IEEE 41-5	5m Premium, Male-Ended, Double-Braided & Shielded GPIB Cable	$119
#IEEE 41-8	8m Premium, Male-Ended, Double-Braided & Shielded GPIB Cable	$145
#IEEE 50-05	0.5m Standard, Male Both Ends, Braided & Mylar Shield GPIB Cable	$39
#IEEE 50-1	1m Standard, Male Both Ends, Braided & Mylar Shield GPIB Cable	$43
#IEEE 50-2	2m Standard, Male Both Ends, Braided & Mylar Shield GPIB Cable	$49
#IEEE 50-4	4m Standard, Male Both Ends, Braided & Mylar Shield GPIB Cable	$59
#IEEE 51-05	0.5m Premium, Male Both Ends, Double-Braided & Shielded Cable	$75
#IEEE 51-1	1m Premium, Male Both Ends, Double-Braided & Shielded Cable	$79
#IEEE 51-2	2m Premium, Male Both Ends, Double-Braided & Shielded Cable	$89
#IEEE 51-3	3m Premium, Male Both Ends, Double-Braided & Shielded Cable	$95
#IEEE 51-4	4m Premium, Male Both Ends, Double-Braided & Shielded Cable	$105
#IEEE 51-5	5m Premium, Male Both Ends, Double-Braided & Shielded Cable	$115
#IEEE 51-8	8m Premium, Male Both Ends, Double-Braided & Shielded Cable	$139
#IEEE 60-1	1m, Premium, Male-to-Female GPIB Extension Cable	$69
#IEEE 60-2	2m, Premium, Male-to-Female GPIB Extension Cable	$79
#IEEE 60-3	3m, Premium, Male-to-Female GPIB Extension Cable	$89

IEEE-488 Accessories (Other accessories available – please call for more information)

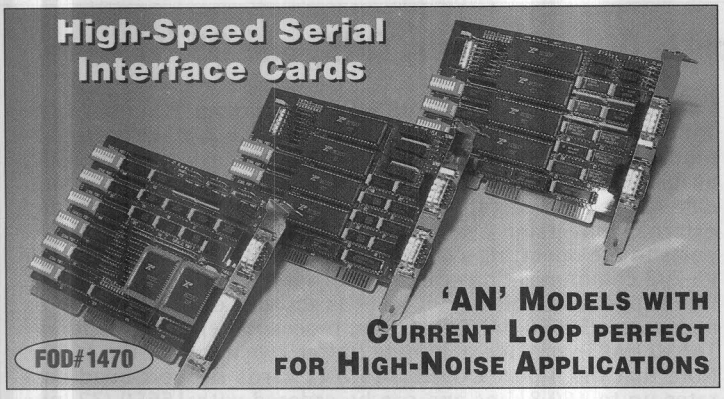
#IEEE SB-2W	2-way Switch Box: A or B to I/O (Metal Case, EMI/RFI Shielded)	$99
#IEEE SB-3X	3-way Switch Box: A, B, or A+B to I/O (Metal, EMI/RFI Shielded)	$125
#IEEE SB-4W	4-way Switch Box: A, B, C, or D to I/O (Metal, EMI/RFI Shielded)	$165
#IEEE BH-MF	Bulkhead Adapter, M-F (Easiest way to feed cables through panels)	$35
#IEEE BH-FF	Bulkhead Adapter, F-F (F-F to attach multiple cables on both sides)	$35
#IEEE BR-FF	Bulkhead Adapter, Reverse/180°, F-F (Reverses cable direction)	$35
#IEEE RT-MF	Right Angle Adapter, 90°, M-F (Helps avoid tight cable bends)	$32
#IEEE RA-MF	Reverse Adapter, 180°, M-F (To mate & extend 2 GPIB cables)	$26
#IEEE RA-FF	Reverse Adapter, 180°, F-F (F-F makes it easy to attach cables)	$26
#IEEE EX-MF	GPIB 1" Extender, M-F (Provides 1 inch added clearance)	$25
#IEEE SE-MF	Slimline 1" Extender, M-F (Perfect for use with PC cards, .615" wide)	$25
#IEEE ME-MF	Modified 1" Extender, M-F (For use where male shield is too long)	$25
#IEEE SRE-MF	Slimline Reverse Extender, 180°, M-F (Reverses cable direction)	$29
#IEEE RE-FF	Reverse Extender, F-F (Adds 1" clearance, reverses cable direction)	$29
#IEEE MT-4	Ganged Receptacle Panels (4-connector multi-tap bus strip)	$99
#IEEE MT-8R	Ganged Receptacle Panels (8-conn. rack-mount multi-tap strip)	$199
#IEEE CC-F	Metal GPIB Cable Cover, for F (Protects unused cable connectors)	$6
#IEEE CC-FB	Metal GPIB Cable Cover, Black, for F (Same as above, but black)	$6
#IEEE CC-M	Metal GPIB Cable Cover, for M (Covers male GPIB connectors)	$6

Many cables are available from stock for immediate shipment — other cable styles/lengths & accessories take 1 week.
In a Hurry? We offer Same Day Shipment from stock at no extra charge on orders released for shipment by 2:00 PM E.S.T.

QUANTITY DISCOUNTS: 1-4: LIST 5-9: 5% 10-24: 10% 25-49: 15% | QUANTITY OF CABLES PER SHIPMENT – CALL FOR DETAILS

CyberResearch Assistance: Toll-Free 1-800-341-2525 (USA) Tel: 203-483-8815 Fax: 203-483-9024
Applications Engineers: Mon-Fri, 9 AM-5 PM U.S. Eastern Time • Internet Website: http://www.cyberresearch.com • Fax-on-Demand System: 203-483-9966 • BBS: 203-488-8949

460k-baud Serial/Current Loop Cards



QUICK LOOK:

- Advanced 16C550 UARTS standard on all cards
- Individual addressing for each port
- 11 different interrupt options per port
- Individual port addressing 0-3FF hex
- Baud rates to **460.8k** bits per second (460,800 baud)
- DTE / DCE selectable RS-232 ports
- Interrupt sharing
- Interrupt status register with sequencer
- Digiboard™ emulation

New Cards offer Powerful Features at a Great Price

CyberResearch now offers a complete line of low-cost, high performance RS-232, RS-422/485 and Current Loop cards, as well as our new "All-in-One" card which includes all the above protocols *on a single card.* All our new BLS-series cards come with 16C550 or 16C552 UARTs which feature 16-byte transmit and receive buffers to help guard against loss of data in your busy system. All cards may be addressed as COM1-COM4 or any other I/O address you choose from 000 up to 3F8 hex. All of these cards use one or more standard DB-9 (9-pin "D") connectors.

Interrupt Sharing: The Key to Adding Many Serial Ports

Our interrupt sharing allows multiple ports on a single card, as well as multiple cards (up to 4) in a single system, to all use the same interrupt. With this technology, up to 16 ports in one system (four 4-port cards) can share one interrupt. Any of eleven interrupt choices are available for each port. The interrupt status register may be located at any address, and when used with interrupt sharing, it will supply you with a pointer to indicate which port has an interrupt pending. This feature allows you to find out which of up to 8 ports has a pending interrupt *with only a single read operation.* RS-232 and 422 units are **jumper-selectable for compatibility with protocols used by Digiboard.** This functionality provides drop-in replacement capability at reduced cost. Because each port's address may be defined individually, you don't have to worry about address conflicts as you do with cards which use 32 and 64-byte blocks for addressing. These cards are compatible with all application software that communicates with a standard serial port using an 8250 or 16C450 type UART (the UARTs which virtually all PCs use for serial ports). This includes compatibility with DOS, OS/2, Windows, Windows 95, Windows NT, UNIX, and XENIX.

RS-232 Cards & RS-422/485 Cards

Our **RS-232 cards** support the standard RS-232 interface and all the above mentioned features. The card is DTE/DCE selectable so no special cables are required. Each port supports all handshake and MODEM control lines, including: TXD, RXD, RTS, CTS, DSR, DCD, DTR, and RI.

Our **RS-422** and **RS-485** cards support both standards, with a jumper option to select 2 or 4-wire operation. Drivers and receivers may be always enabled, or drivers may be enabled with RTS or DTR. If you choose the Auto-Enable option, you may enable drivers and disable receivers automatically simply by sending the data. Drivers are automatically disabled within 100 microseconds of transmission of the stop bit. Drivers and receivers may also be controlled with data bits 0 and 1 by writing to the base address +7 for the port (MetraByte COM-485 protocol compatible). RTS and CTS flow control is supported as well. Convenient on-board jumpers allow for 100Ω termination as needed for each driver and receiver.

All-in-One Cards

Powerful all-in-one models feature RS-232, RS-422/485, and Current Loop, all on one card. You pick which protocol you want to enable. Model **BLS AN11S** is MetraByte COM-422 compatible with the additional capability of RS-485 operation. The **BLS AN12SE** is a dual-port version with additional interrupts available. Ports are configured independently for the protocol you wish to use.

Current Loops are switch-selectable for 20 or 60 milliamps and active or passive operation. These cards are the top-of-the-line for multi-port current loop operation. Units feature a guaranteed OFF state of less than 2 milliamps of loop current.

Call our Fax-on-Demand system for more detailed information on these products: **203-483-9966**, ask for document **FOD# 1470**.

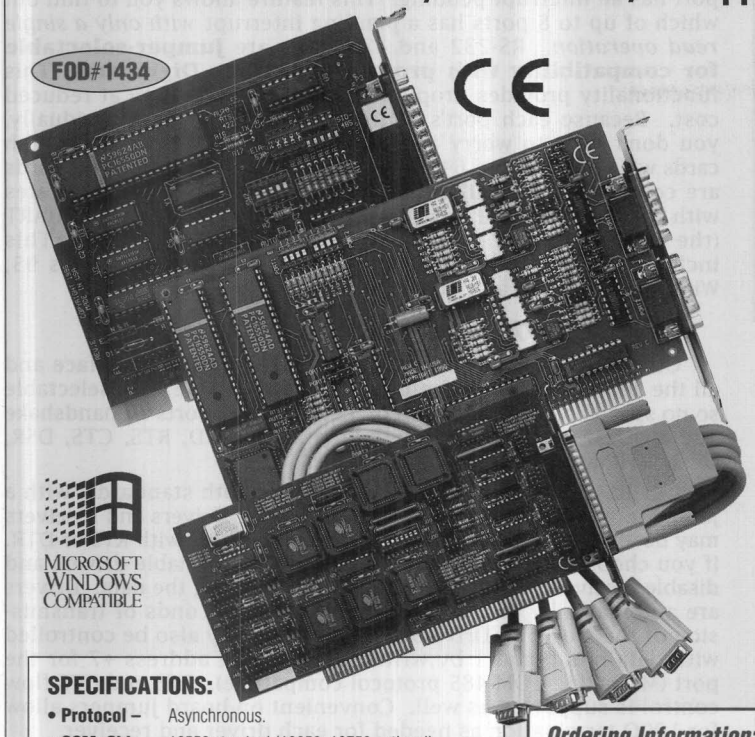
Comparison Chart: BLS-series High Speed Serial/Parallel Interface Cards

Part #	Price	Number of Ports	RS-232	RS-422 & 485	Current Loop	Baud Rates (max)	Hardware Handshaking	Parallel Ports	Interrupts	Interrupt Sharing	Status Register
#BLS 2321S	$99	1	Yes	–	–	460.8 kbaud	Y	–	3, 4, 5, 6, 7, 9, 10, 11, 12, 14, 15	–	–
#BLS 2322S	$109	2	Yes	–	–	460.8 kbaud	Y	–	3, 4, 5, 6, 7, 9, 10, 11, 12, 14, 15	Yes	–
#BLS 2324S	$199	4	Yes	–	–	460.8 kbaud	Y	–	3, 4, 5, 6, 7, 9, 10, 11, 12, 14, 15	Yes	Yes
#BLS 2328S	$449	8	Yes	–	–	460.8 kbaud	Y	–	3, 4, 5, 6, 7, 9, 10, 11, 12, 14, 15	Yes	Yes
#BLS 2322S1P	$119	2 + 1 Par.	Yes	–	–	460.8 kbaud	Y	1	3, 4, 5, 6, 7, 9, 10, 11, 12, 14, 15	Yes	–
#BLS 2324S2P	$219	4 + 2 Par.	Yes	–	–	460.8 kbaud	Y	2	3, 4, 5, 6, 7, 9, 10, 11, 12, 14, 15	Yes	Yes
#BLS 4221S	$109	1	–	Yes	–	460.8 kbaud	Y	–	3, 4, 5, 6, 7, 9, 10, 11, 12, 14, 15	–	–
#BLS 4222S	$129	2	–	Yes	–	460.8 kbaud	Y	–	3, 4, 5, 6, 7, 9, 10, 11, 12, 14, 15	Yes	–
#BLS 4224S	$229	4	–	Yes	–	460.8 kbaud	Y	–	3, 4, 5, 6, 7, 9, 10, 11, 12, 14, 15	Yes	–
#BLS 4228S	$449	8	–	Yes	–	460.8 kbaud	Y	–	3, 4, 5, 7, 9, 10, 11, 12, 14, 15	Yes	Yes
#BLS CL1S	$119	1	–	–	Yes†	460.8 kbaud	–	–	3, 4, 5, 6, 7, 9, 10, 11, 12, 14, 15	–	–
#BLS CL2S	$149	2	–	–	Yes†	460.8 kbaud	–	–	3, 4, 5, 6, 7, 9, 10, 11, 12, 14, 15	Yes	Yes
#BLS AN11S	$129	1	Yes	Yes	Yes†	115.2 kbaud	Y	–	3, 4, 5, 6, 7, 9	–	–
#BLS AN12S	$189	2	Yes	Yes	Yes†	460.8 kbaud	Y	–	3, 4, 5, 6, 7, 9, 10, 11, 12, 14, 15	Yes	–
#BLS AN12S1P	$199	2	Yes	Yes	Yes†	460.8 kbaud	Y	1	3, 4, 5, 6, 7, 9, 10, 11, 12, 14, 15	Yes	–

1S boards to be upgraded to 460kbaud soon. † Speeds of transmission for current-loop applications vary with environmental conditions, length of transmission, and type of cable used.

Turn Your PC into an Industrial Controller with

Automatic RS-485/422 Serial I/O Supports DOS, Windows, QNX, and OS/2!



Seamlessly link RS-422/485 devices to your PC under DOS, Windows 3.1x, Windows 95/NT, QNX, OS/2, and other protected-mode operating systems. This family of cards automatically enables/disables the driver (transmitter) & receiver based on your data rate, eliminating the need for costly driver replacements and external conversion boxes. These cards simply look like COM: ports to the operating system, therefore initial development for RS-232 communications can be effortlessly modified for RS-485. We include selectable high level IRQs allowing ease of integration, and we use 16550 UARTs to lessen processor servicing. Optional 16650 UARTs provide a 32-byte buffer, twice that of the 16550. Note that the 4-port **COMH 3440/41** cards support quad data rates up to 460.8 kbps and can be ordered with 16650 (32-byte buffer) or 16750 UARTs (64-byte buffer).

Windows 3.1x – Each port may be set to a separate IRQ. Up to 4 COM: ports can be controlled under Windows 3.1x. An optional driver is available supporting up to 9 COM: ports (**COMH 6400**: $**79**).

Windows 95 – Each port may be set to a separate IRQ. We include Windows 95 **INF** files to make installation simple. Windows 95 supports as many ports as you have free IRQs.

Windows NT – Each port may be set to a separate IRQ or share IRQs with the 3440 and 3441 cards. We include a Windows NT setup utility to make card installation and Windows NT registry configuration safe and painless. Both the 3440 & 3441 cards have an on-board interrupt status port allowing IRQ sharing under Windows NT 3.51 & 4.0.

SPECIFICATIONS:

- **Protocol –** Asynchronous.
- **COM: Chip –** 16550 standard (16650, 16750 optional).
- **Data Rate* –** COMH 3055: 115.2 kbps (460.8 kbps optional); COMH 3089: 115.2 kbps (460.8 kbps optional); COMH 3440: Up to 460.8 kbps standard.
- **Interrupts –** 2 to 7, 10 to 12, and 15 (for all three boards).
- **Size –** 3055: 5.0"L x 4.2"H (12.70 x 10.66cm); 3089: 7.35"L x 4.2"H (18.67 x 10.66cm); 3440: 8.0"L x 4.2"H (20.32 x 10.66cm).
- **Software –** Serial Utility Disk.

*max. data rate depends on CPU, software, and cable length.

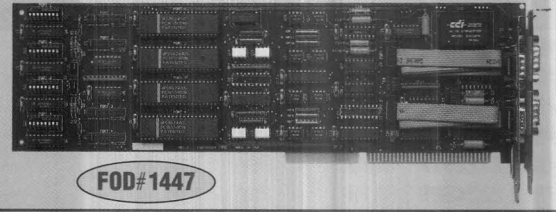
Ordering Information: **Call Fax-on-Demand for more Information: 203-483-9966 FOD#1434**

#COMH 3055	Single-Port Fully Automatic RS-422/485 Serial Interface Card	**$179**
#COMH 3089	Two-Port Fully Automatic RS-422/485 Serial Interface Card	**$239**
#COMH 3189	Two-Port Isolated Fully Automatic RS-422/485 Serial Interface Card	**$289**
#COMH 3440	460.8 kbps Four-Port Automatic RS-422/485 Serial Interface Card	**$369**
#COMH 3441	460.8 kbps Four-Port Non-Automatic RS-422/485 Serial Interface Card	**$319**

Add suffix **–S** for 16650 option (example: **COMH 3089-S** add $**7** x 2 ports = add $**14**) .....ADD $**7/port**
Add suffix **–X** for 16750 UART option for **COMH 3440** and **3441**.....ADD $**10/port**

Control Your RS-422/485 Devices from Your PC at up to 4,000 feet!

Our RS-422/485 serial communications boards utilize the 16550 UART, the same UART found in the IBM™ Asynchronous serial adapter. This means that writing to one of our adapters is virtually the same as writing to the IBM serial port. The output of each port may be set for half duplex transmissions for RS-485 operation, or for full duplex transmission for RS-422 operation. Address locations are switch selectable and interrupt request lines are set via on-board jumper blocks. Single port boards have a DB25-pin male connector, while dual and quad boards use DB9-pin male connectors. Baud rates to 115.2 kbps are supported as standard, while quad speeds up to 460.8 kbps are optional. RS-485 two or four-wire operation is supported.



SPECIFICATIONS:

- **Protocol –** Asynchronous.
- **COM: Chip –** 16550 standard (16650 optional).
- **Data Rate* –** 115.2 kbps (460.8 kbps optional)
- **Interrupts –** COMH 039: 3-4; COMH 037, 131: 2-5; 3415-19: 2-7, 10-12, 15
- **Size –** 4.2"H: COMH 039: 4.9"L; COMH 037: 4.6"L; COMH 131: 4.9"L; COMH 3415-19: 13.33"L
- **Software –** Serial Utility Disk.

*max. data rate depends on CPU, software, & cable length.

Isolation – Choose either two-channel isolated automatic RS-422/485 (**COMH 3189,** above) or two- & four-channel isolated RS-232/422/485 interface boards. Isolation is important in applications where the equipment being connected is either far from the PC, or on a different power transformer circuit. Ground loop current is a commonly neglected and misunderstood phenomenon that leads to failure and destruction of communications interfaces. These isolated serial boards from CyberResearch provide up to 500VDC of ground isolation.

Ordering Information: Use **FOD#1457** to request info on COMH 037/039/131

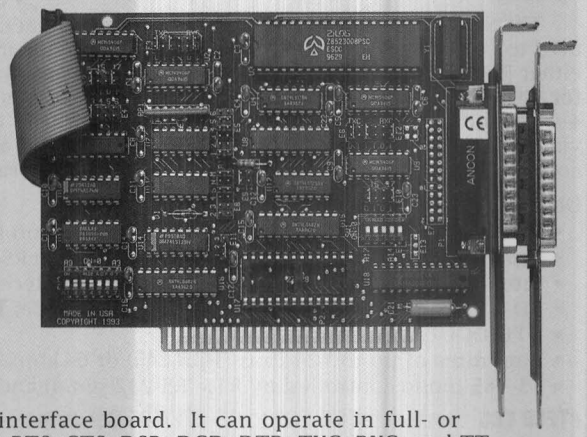
#COMH 039	Single-Port RS-422/485 Interface Card	**$129**
#COMH 037	Two-Port RS-422/485 Interface Card	**$169**
#COMH 131	Four-Port RS-422/485 Interface Card	**$269**
#COMH 3417	Two-Port Isolated RS-422/485 Interface Card	**$329**
#COMH 3419	Two-Port Isolated RS-232 Interface Card	**$329**
#COMH 3415	Four-Port Isolated RS-422/485 Interface Card	**$429**
#COMH 3418	Four-Port Isolated RS-232 Interface Card	**$429**

Add suffix **–S** for 16650 UART option (ex. **COMH 3082-S**)...ADD $**7/port**

CyberResearch Assistance: Toll-Free 1-800-341-2525 (USA) Tel: 203-483-8815 Fax: 203-483-9024
Applications Engineers: Mon-Fri, 9 AM-5 PM U.S. Eastern Time • **Internet Website:** http://www.cyberresearch.com • **Fax-on-Demand System:** 203-483-9966 • **BBS:** 203-488-8949

CyberResearch RS-422/RS-485 Interface Boards!

Increase Your Data Rates to 1 Mbps with CyberResearch's Sync/Async DMA Cards!



Are the limitations placed on your applications by typical Asynchronous I/O adapters just not acceptable? Pick one of our powerful Sync/Async adapters and increase your maximum performance by nearly 10 times over asynchronous-only cards. That's because our Sync/Async adapters utilize DMA (Direct Memory Access) to blast data at up to 1 Mbps. These high performance cards support various protocols including SDLC, HDLC, X.25, Monosync, Bisync, and high speed Asynch making them perfect for Satellite multicast/file transfer, wireless network communications, CSU/DSU interfacing, and high speed data transfer applications. Port address, IRQ level, and DMA channel are all selected through switches and jumpers on the boards. These boards are based on the Zilog™ 85230-8 Enhanced SCC featuring software-selectable baud rate. These cards can accept an external clock or provide a clock allowing the application to remain in sync.

The **COMH 232** is a high speed, two port RS-232 serial communication interface board. It can operate in full- or half-duplex modes. RS-232 modem control signals supported include TD, RD, RTS, CTS, DSR, DCD, DTR, TXC, RXC, and TT.

COMH 237 is a high speed RS-422/485/EIA-530 serial interface board designed for speeds up to 1Mbps with DMA; it supports TD, RD, RTS, CTS, DSR, DCD, DTR, RXC, TXC, TT, LL, RL, and TM signals along with full EIA-530 modem control signals. Model **COMH 4111** also includes DMA channels 0, 1, 2, or 3 allowing full duplex DMA on both channels as well as a terminal count interrupt.

SPECIFICATIONS:

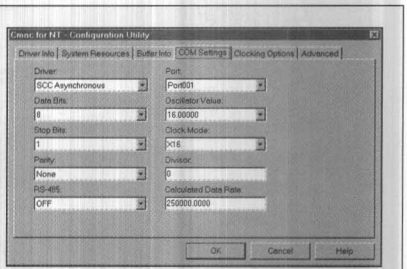
- **Protocol –** Asynchronous.
- **Chip –** Zilog 85230-8 standard.
- **Speed –** Up to 1.2288M bps; max. data rate depends on CPU, software & cable length. Speed of COMH 232 adapter limited by RS-232 standard, typically 64kbps.
- **Interrupts –** 3 & 4 (COMH 232); 2 to 5 (COMH 237); 2 to 7, 10 to 12, & 15 (COMH 4111).
- **Size –** COMH 232: 4.9"L x 4.2"H (12.47 x 10.668cm); COMH 237: 6.2"L x 4.2"H (15.75 x 10.668cm); COMH 4111: 7.8"L x 4.2"H (19.81 x 10.668cm).

Ordering Information: **Call Fax-on-Demand for Info: FOD#1437 & 1441**

#COMH 232	Two-Port Sync/Async RS-232 Adapter	**$319**
#COMH 237	Two-Port Sync/Async RS-422/485 Adapter	**$319**
#COMH 4111	Two-Port RS-422/485 Adapter with AT IRQs	**$339**

Software Included: Serial Utility Disk.

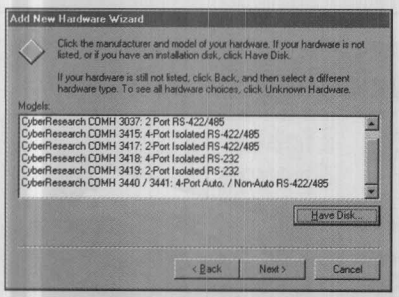
Drivers, Applications, and Samples



Each of the three products listed above (this page) includes our Developer Toolkit. This Toolkit provides Drivers, Samples, Applications, and programming information gathered over the years.

We offer a family of developer-oriented solutions for DOS, Windows 3.1x/95, and Windows NT known as CMAC (Communications Media Access Control). This family of drivers has a common API (Application Pro-grammer Interface) that is implemented in a Windows dynamic link library (DLL). This API gives programmers access to our products from multiple Windows-based development platforms such as Visual C++, Visual Basic, and Delphi.

Our goal is to provide the developer with a single, high-level programming interface that will function with a variety of Cyber-Research products across today's mainstream operating systems. Low-level drivers communicating through the CMAC API will support a variety of available data formats including SDLC/HDLC, MONOSYNC, BISYNC, and ASYNC.



Multiport Serial Card Drivers, Applications, and Samples (for cards on the facing page)

All of our UART-based cards, shown on the facing page, are supplied with our CCOM multi-port driver software which supports up to 32 serial ports per installation (multiple installations allow for a maximum of 288 serial ports). CCOM for **DOS** is included on the Serial Utility Disk supplied with all of our UART-based serial cards.

Windows 3.x drivers (supports up to 4 COM: ports) are included with each card. Optional driver software that supports up to 9 COM: ports is available for $79 (**COMH 6400**). **Windows 95** supports as many COM: ports as you have available interrupts (IRQs). A **Windows NT** setup utility is included on the serial utility disk supplied with each board.

APPLICATIONS:

- **ProTest** – Communications link monitor and analyzer software. Includes macro language support to control transmission and reception of sync and async data.
- **CTerm** – Binary & text file transfer software for use across any sync/async communication link. Supports X-MODEM, X-MODEM 1K, Y-MODEM and Y-MODEM G protocols. CTerm can also function as an ASCII terminal.
- **CBERT** – Bit error rate testing application.

SAMPLES:

- **MFCTerm** – Includes CTerm source code without protocol support. Developed using Microsoft Visual C++ & Microsoft Foundation Class libraries.
- **VbTerm** – Microsoft Visual Basic 4.0 terminal and text file transfer sample source code. Allows testing of all CMAC API calls. Optional mode provides verification of transmitted data.
- **ConTest** – 32-bit Windows console sample source code. Allows testing of all CMAC API calls. Optional mode provides verification of transmitted data.

Superior Quality Serial Interface Converters

SUPERVERTER™ Handles *both* RS-422 & RS-485

The SUPERVERTER is a unique interface converter that can be configured to communicate between an RS-232 port and devices which are either RS-422 or RS-485. It provides intelligent control over the line for operation in RS-485 mode, and can be configured as a 2-wire or a 4-wire converter. In half-duplex mode, it can control transmission via the use of RTS (pin 4), or the RS-232 TD line will automatically control transmission when data is present. **Fax-on-Demand: FOD#1465.**

Outstanding features of the **SUPERVERTER** include:

- User-selectable RS-422 or RS-485 communication mode
- Dip switch-selectable 2- or 4-wire connections in RS-485 mode
- Intelligent control of RS-485 Transmitter and Receiver
- TD & RD status LEDs on both models (1 set/side: **TELB 245**)
- DTE/DCE compatible
- Data rates of up to 128 kbps (**TELB 245**) or 64 kbps (**TELB 285**)
- RS-485 mode controlled by RTS (RS-232 pin 4) and DATA

#TELB 285 SUPERVERTER RS-232 to RS-422/485 Converter.....**$135**
#TELB 285-220 SUPERVERTER with 220V Power Supply.....**$145**
#TELB 245 Opto-Isolated SUPERVERTER RS-232 to 422/485.....**$226**
TELB 245: Please specify power supply when ordering: 120VAC, 220VAC (**–220**), –48VDC (**–48**), +24VDC (**–24**), +12VDC (**–12**).

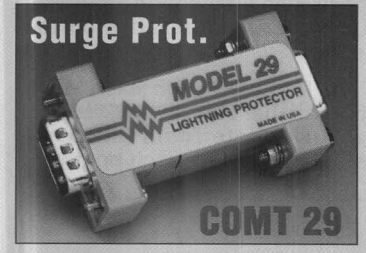
Protect your PC with Opto-Isolation Modules

Serial transmission lines extending over hundreds or thousands of feet can become dangerous lightning rods attracting surges which can damage your computer. When your communication system uses more than one power source or operates at different ground potentials, it is important to isolate the components of the system to eliminate the effects of noisy signals, ground loops, and power surges.

Our opto-isolation modules completely eliminate all electrical connections between the internal and external sides of your RS-232 or RS-422 port. **TELB 268** provides a full duplex plus handshake link for RS-232 signals. **TELB 281** isolates the TD and RD signal paths, and the RTS/CTS or DTR/DCD (jumper-selectable) control signals for RS-422 users. Opto-isolation modules will only operate if the TD and RD signal grounds have been connected and provide a maximum isolation of 500VAC. Data transmission rates up to 19.2 kbps are supported, and loads as low as 100Ω can be driven. Operating range is 0° to 50°C.

#TELB 268 Opto-Isolation Module for RS-232 **Fax Info: FOD#1468** **$106**
#TELB 281 Opto-Isolation Module for RS-422 **Fax Info: FOD#1452** **$158**

Surge Protectors & Lightning Sponges for Serial and Telecommunications Connections



While surge protectors have become standard equipment on PCs, protecting delicate components against voltage transients, many people do not consider that their modem and serial interface connections to the outside world can leave their PC open to voltage spikes from their outside data transmission lines.

Our surge protectors and lightning sponges provide much-needed shielding for your PC. Telecommunications line anomalies and inclement weather power problems are safely blocked or shunted away from your equipment through the use of Avalanche Diodes, Gas Discharge Tubes, & MOV thyristors. **Fax Info: FOD#1429.**

#COMT 24 DB-25 Lightning Sponge for RS-232 Cables — Protects pins 2, 3, & 7 in both directions using Gas Tubes & 1500-watt Avalanche Diodes **$68**
#COMT 27–x DB-25 Lightning Suppressor — 24 lines protected by individual 600-watt Aval. Diodes (no pin 1) – Specify RS-**232** or RS-**422**/EIA-530/MIL-STD-188-114 .....**$48**
#COMT 29–x DB-9 Lightning Suppressor — Perfect for 9-pin Serial Ports, all 9 lines protected by individual 600-watt Avalanche Diodes – Specify RS-**232** or **-422**/EIA/MIL .**$44**
#COMT 22–232 4-wire RS-232 Lightning Sponge — For Short-Haul Modems & 4-wire links, ±14V max, to 38.4kbps. Screw terminals at each end, add **–P** for model w/RJ-12 jacks ..**$75**
#COMT 22–422 4-wire RS-422 Lightning Sponge — For RS-422 connections & other low-voltage (±7.5V max), 4-wire serial links at up to 1Mbps; screw terminals each end ..**$69**
#COMT 22–TEL 2-wire Lightning Sponge for Modems — For phone line-to-modem connections (180V max for phone lines); protects modem & PC. RJ-12 jack on each end..**$69**

–X – Please specify RS-**232** or RS-**422**/EIA-530 when ordering a **COMT 27** or **COMT 29**. For example, model **COMT 29** for an RS-232 port, order part #**COMT 29-232**.
Call for information on surge protectors for T1 & 56Kbaud Telco lines, and surge protectors for data/phone 25-line connections (std. 50-wire Telco). 10BaseT surge protectors, too.

CyberResearch Assistance: Toll-Free 1-800-341-2525 (USA) ☎ Tel: 203-483-8815 Fax: 203-483-9024
Applications Engineers: Mon-Fri, 9AM-5PM U.S. Eastern Time • **Internet Website:** http://www.cyberresearch.com • **Fax-on-Demand System:** 203-483-9966 • **BBS:** 203-488-8949

Alternative Serial Communications Standards

Tech Notes

Mike Mathis

A "serial" port is any port where data is transmitted digitally, over a single data line, with bits of information transmitted one at a time (i.e. serially). This contrasts with parallel interfaces where digital information is transferred a byte at a time, across 8 or 16 data lines. Our Digital I/O Boards (shown on pp. 72-75) are examples of parallel interfaces.

Differential Voltage Transmission

The RS-232 standard is limited in the distances that it can travel and the baud rates that it can handle. This is primarily because RS-232 ports use single-ended voltage lines for data and control signals. The RS-422 standard overcomes this problem by using differential voltage pairs for data transmission. Whereas the single-ended data lines used by RS-232 will suffer voltage drops and will pick up serious amounts of noise when extended over 50', the differential between the RS-422 voltage pairs will remain constant over distances extending several miles. The twisted pairs used in RS-422 are also relatively immune to cross-talk, allowing them to handle higher baud rates.

RS-485 for Multiple Serial Devices

RS-485 is a version of RS-422 which has been optimized to allow up to 32 serial devices on one multi-drop line. RS-485 always runs in half-duplex mode, meaning that it uses the same pair of wires for transmitting and receiving data. Any serial device used on an RS-485 network needs to have some intelligence to know when it is being addressed. RS-485 can be an economical way to set up a "peer-to-peer" network. However, it's also very slow because only one device at a time can be sending data.

Understanding Data and Control Lines

Any serial port has two data lines. These are referred to as **TD** (Transmit Data) and **RD** (Receive Data). RS-422 devices running in "Full-Duplex" mode will have two pairs of data lines: TD+, TD–, RD+, and RD–. In this mode they can send and receive data at the same time. In "Half Duplex" mode, transmit and receive data are shared on a single pair of lines: TD+/RD+ and TD–/RD–. A device configured for half-duplex operation can not transmit and receive at the same time. RS-485 always runs in half duplex mode. **RTS** (Request To Send) and **CTS** (Clear to Send) are the most commonly used control signals. They are not actually transmitted, but are used internally to enable or disable the TD lines.

Optically-Isolated Converter

Your computer can be protected at the power supply, but can still suffer a devastating shock from power surges picked up over long data lines. These units serve double duty, providing both RS-422 conversion *and* optical isolation.

- **Optical isolation exceeds 10,000V**
- Earth ground connection
- Switch selection of DCE or DTE
- LED status indicators on data lines
- Wall transformer powers the unit
- Data rates to 19.2 kbaud at **2 miles**
- RS-232 Connector: DB-25
- RS-422 Connector: 4 screw terminals + gnd

#COMT 265 Optically-Isolated RS-232 to RS-422 Converter Module (Male DB-25 w/F-F adapter)....**$142**
#COMH 632 Non-Isolated, Low-Cost RS-232 to RS-422 Converter Module (Male DB-25).....**$99**

High Speed RS-422 Converters

These RS-422 converters handle very high data rates. Versions powered off of your PC's serial port also available.

- **Data rates to 256kbaud** (even at 1000 ft.)
- Converts all 8 data & control signals
- Different models for DCE or DTE
- RS-232 Connector: DB 25-pin male
- RS-422 Connector: DB 25-pin female
- Powered by included 120V wall-plug transformer (add **–220** to part # for 220V version)
- Distances: 256kbps @ 1000ft; 100kbps @ 4000ft; 19.2kbps @ 6000ft; 9600bps @ 18,000ft (3.4 miles)

#COMH 633S 256kbps High Speed RS-232 to RS-422 Converter Module (DCE).....**$129**
#COMH 634S 256kbps High Speed RS-232 to RS-422 Converter Module (DTE).....**$129**

Low Cost RS-485 Converters

The RS-485 standard allows your PC to communicate with up to 32 devices using just a single twisted pair.

- Data Rates to 38,400 Baud
- DCE/DTE switch-selectable
- LCD display for visual status of all signals
- **COMT 366M**: Male DB-25 RS-232 Connector
- **COMT 366F**: Female RS-232 Connector
- RS-485 Connector: 5 screw terminals
- Low price includes wall transformer

#COMT 366M RS-232 to RS-485 Converter....**$115**
#COMT 366F RS-232 to RS-485 Converter...**$115**

LCD display shows live status of data & control signals: TD, RD, RTS, CTS, DSR, DCD, and DTR.

Current Loop Converter

Now your PC can talk to any sort of current-loop device such as teletypes, etc. Current loop transmission provides optical isolation and is ideal for noisy environments.

- 20mA or 60mA operation
- DCE/DTE, full/half-duplex selectable
- Active/passive loops supported
- Optically-isolated
- Powered from included wall transformer
- Data Rates to 9,600 baud
- RS-232 Connector: DB-25 Male
- Current Loop Connector: 5 screw terminals
- Dimensions: 2"W x 4.1"L x 0.75"H

#COMT 65X RS-232 to Current Loop Converter....**$99**

Your PC can talk to current-loop devices with our RS-232 to Current Loop converter. Powered by a 120V wall transformer (add –220 for 220V).

Complete Stepping Motor Systems with Matched Components give you Optimum Performance

We have configured several typical systems that include the most popular combinations of components. Each system includes:

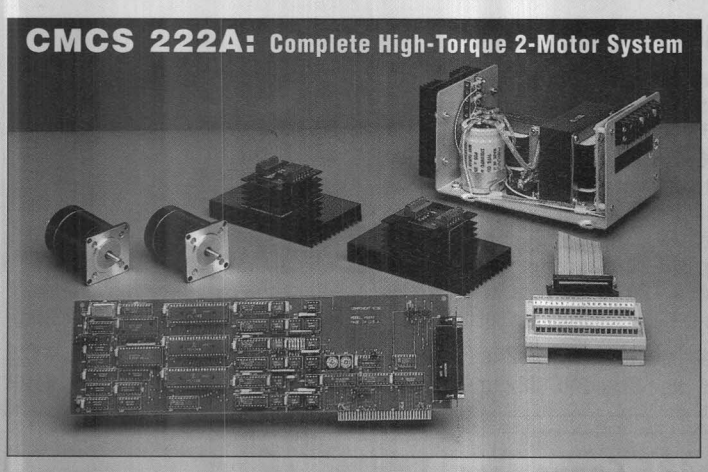
1. A stepping motor controller.
2. Motors, either Size 23 (high-speed) or Size 34 (high-torque).
3. Bi-polar chopper drivers, either standard or microstepping.
4. Terminal panels to make wiring easier between components.
5. A power supply with enough wattage for rated performance.

The system speed and torque ratings reflect the performance possible with the configuration shown. Speed ratings represent the speed at which the motor torque falls to 20% of the holding torque (see the motor speed/torque curves on page 96).

By mixing and matching various models of these 5 basic components, you can come up with a system to meet your own unique requirements. Start by choosing a controller, the most important component in your system. Then use the speed/torque curves on page 63 to help you choose a motor which has the characteristics you require. Be sure to choose a driver and power supply which can deliver the full rated current (Amps) to the motor you will be using. A microstepping driver will provide smoother operation.

These systems represent only a small fraction of the configurations that can be assembled from components we carry. If you don't see the right combination listed, call our applications engineers for assistance in configuring a system to meet your specific needs.

CyberResearch Complete Stepping Motor Systems (Several Examples – Call or fax for other Complete Systems)



#**CMCS 222B** High-Torque Dual Motor Size 23 System.....$**1695**

Holding Torque:	**120 oz-in**	
Speed Rating:	**2,000 steps/second**	*Page*
ESH 5002	2-Axis Stepping Controller Board	*89*
2 ea **SMD 103**	40V, 3.5A Bi-Polar Chopper Driver	*94*
2 ea **SMD 110**	Heat Sink for SMD 103	*94*
2 ea **ORM 268K**	Size 23 Stepping Motor	*96*
MUS 40-06	40VDC, 6A Unregulated DC Power Supply	*95*
INST 339A	37-Pin Screw Terminal Block w/6-foot Cable	*89*

#**CMCS 021A** Low-Cost Single Motor Size 23 System .....$**995**

Holding Torque:	**83 oz-in**	
Speed Rating:	**5,000 steps/second**	*Page*
ESH 5001	1-Axis Stepping Controller Board	*89*
SMD 102	40V, 2A Bi-Polar Chopper Driver	*94*
ORM 266E	Size 23 Stepping Motor	*96*
MPS 30-02	30VDC, 2A DC Power Supply	*95*
INST 339A	37-Pin Screw Terminal Block w/6-foot Cable	*89*

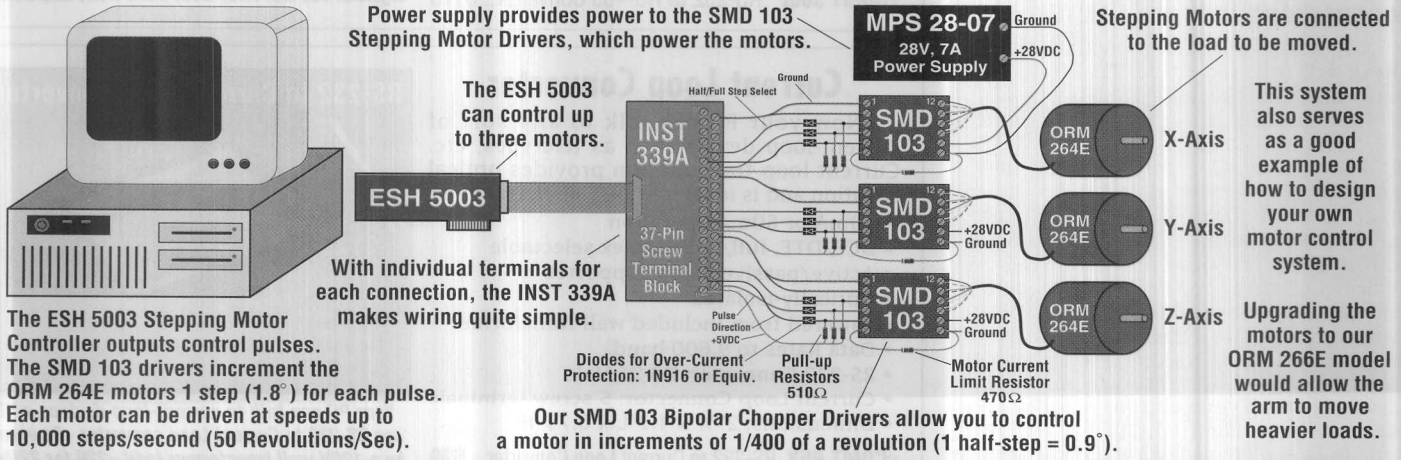
#**CMCS 432** High-Torque 2-Axis Size 34 System, RS-422....$**3495**

Holding Torque:	**611 oz-in per axis**	
Speed Rating:	**2,000 steps/second**	*Page*
2 ea **PANT LI**	3A Panther µStepping Driver w/P.S. & Indexer	*92*
2 ea **ORM 299K**	Size 34 Stepping Motor	*96*
BLS 4222S	Dual RS-422 Serial Interface Card	*83*
2 ea **CBL 0906**	6-Foot Serial Interface Cable, 9-pin Male-Fem.	

#**CMCS 533** 3-Axis Microstepping Size 34 System.....$**3395**

Holding Torque:	**174 oz-in**	
Speed Rating:	**4,000 steps/second**	*Page*
ESH 344	4-Axis Intelligent Microstepping Controller	*89*
3 ea **SMD 707**	60V, 7A Microstepping Driver	*94*
3 ea **ORM 296E**	Size 34 Stepping Motor	*96*
MPS 28-15	28VDC, 15A DC Power Supply	*95*
INST 347B	50-Pin Screw Terminal Block w/Cable	*89*

Low-Cost 3-Axis Size 23 Stepping Motor System #CMCS 123A ($1795)



CyberResearch Assistance: Toll-Free 1-800-341-2525 (USA) Tel: 203-483-8815 Fax: 203-483-9024
Applications Engineers: Mon-Fri, 9AM-5PM U.S. Eastern Time • **Internet Website:** http://www.cyberresearch.com • **Fax-on-Demand System:** 203-483-9966 • **BBS:** 203-488-8949

Intelligent Controllers Make Motion Control Easy

CyberResearch's Intelligent Stepping Motor Controllers can simplify your development efforts by an order of magnitude. These intelligent motor controllers offer an impressive array of features, including:

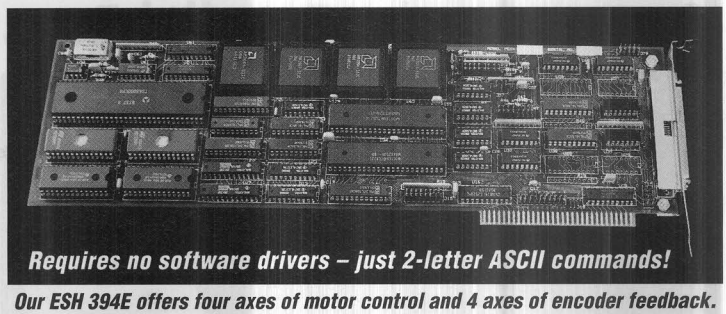
- An on-board microprocessor
- Very high pulse rates — perfect for microstepping
- Constant velocity profiling
- Easy programmability from any language
- Encoder feedback options
- Includes Windows 95 and Windows NT drivers
- and many more

Easily programmed from any language with simple two-letter ASCII commands. Each axis is controlled through four I/O ports for control, status, data, and commands. Each axis can be operated independently, or may be synchronized with other channels. Over 100 different commands are provided in all.

Each board has a Motorola 68000 microprocessor, which means that while the controller board is executing detailed motion control commands, your PC is left free to handle overall supervision.

Step and direction pulses are generated for each axis. All boards are capable of crystal-controlled pulse rates **up to 524,000 steps per second**. High-resolution microstepping of up to 50,000 steps per revolution is possible. High-resolution microstepping allows your motors to run smoothly at all speeds without the "stop-and-go" cogging and the resonance effects that are caused by standard full-step operation. All of these boards are designed to be compatible with our microstepping drivers on pages 92 and 94.

Our two **ESH 340** series boards are low-cost models which make it easy for you to enjoy all the benefits of our intelligent controllers without paying a lot of money. Our **ESH 390** series boards are high-end models which include more axes of control, an encoder feedback option, and additional motion profile modes. Circular interpolation mode is supported on any two axes, and linear interpolation at constant velocity is supported on up to 8 axes. Circular and linear interpolation, along with closed-loop operation, make our **ESH 390** series boards excellent replacements for servo motor systems.



Requires no software drivers – just 2-letter ASCII commands!

Our ESH 394E offers four axes of motor control and 4 axes of encoder feedback.

Ordering information: **Call Fax-on-Demand for info: FOD#5534 & 5538**

#ESH 342	2-Axis Intelligent Stepping Controller	**$795**
#ESH 344	4-Axis Intelligent Stepping Controller	**$995**
#ESH 396	6-Axis Advanced Intelligent Stepping Controller	**$1595**
#ESH 398	8-Axis Advanced Intelligent Stepping Controller	**$1695**
#ESH 392E	2-Axis Controller w/2-Channel Encoder Input	**$1395**
#ESH 394E	4-Axis Controller w/4-Channel Encoder Input	**$1695**
#ESH 396E	6-Axis Controller w/2-Channel Encoder Input	**$1795**
#INST 347B	50-Pin Screw Terminal Block for ESH 342/344	**$105**
#INST 346B2	Terminal w/HD80 Connector for ESH 390 Series	**$195**

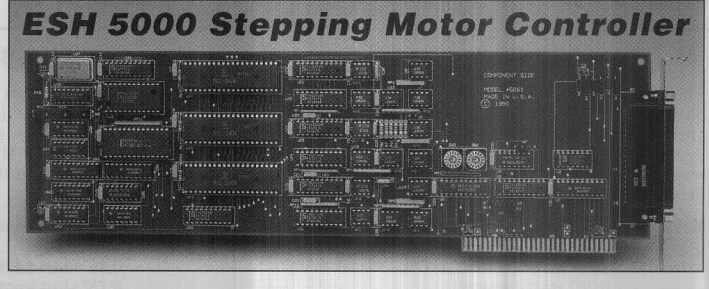
Economical Stepping Motor Controllers

CyberResearch offers an economical motion controller which incorporates many high-performance features. Pulse, Direction, and Hold outputs are supplied for each axis of motor control. The Hold output line is active when the motor is stopped. Full-step operation is standard and switching to half-stepping control is easy via the user-definable digital output line (one per axis). Pulse rates of up to 240,000 steps per second are supported, making the **ESH 5000** well-suited to microstepping applications. It is available in 1, 2, or 3-axis versions, with features that include:

- Motor Controller chips that enable programmable velocity profiling, including choice of direction. Up & down ramps can be programmed independently, and all parameters are changeable during motion.
- Five digital input lines for system limit switches — two stop limits, two acceleration limits, and one home limit input. Connection of your motor drivers and limit switches to the **ESH 5000** is done via a single 37-pin D-connector. To simplify wiring, we offer a 37-pin screw terminal block with 6-ft. cable.
- Optical isolation from your motion system protects against potential voltage spikes which could damage your computer. To isolate your system you must supply an external +5V source to power the output pulse, direction, and control lines. Our **INST 1140** 5-volt power supply is recommended.

Stepping Motor Control Software

Each **ESH 5000** controller comes with three software programs. **PRO5000** is an easy-to-use menu-driven motion profiling program. Designed to assist in the installation of your motion system, PRO5000 allows you to quickly and easily put your motors through their expected movements.



A set of **software drivers** are included for DOS, Windows 3.1, and Windows 95 (16-bit), including demos of Visual BASIC and Visual C++. Also included is a **command interpreter** to assist in designing your motion control software. Source code is included for both the drivers and the command interpreter. **Coordinated Motion Software** is a DOS-based package to assist in controlling movement of pairs of motors at once for linear and circular interpolation (arcs, patterns, etc). Stepper Motor drivers are on pages 92 and 94; motors are on page 96.

Ordering Information: **Call Fax-on-Demand for more info: 203-483-9966 FOD#5550**

#ESH 5001	1-Axis Low Cost Stepping Motor Controller Board with Software	**$595**
#ESH 5002	2-Axis Low Cost Stepping Motor Controller Board with Software	**$695**
#ESH 5003	3-Axis Low Cost Stepping Motor Controller Board with Software	**$795**
#ESH 5000NT	Windows NT 4.x Driver Library (32-bit)	**$295**
#ESH 5000C	Coordinated Motion Control Software	**$295**
#INST 339A	37-Pin Terminal Block with 6-foot Cable	**$95**
#INST 1140	5V, 1A Wall-Plug Power Supply	**$39**

New Inexpensive MD2 Dual Stepper Motor Systems

Connect to the Parallel Port, Load the Software, and *GO!*

The Complete Motion Control Solution

We've cut through the confusion and created **the *complete* motion control solution.** The result: a unique line of inexpensive and practical automation products that are packaged complete, with a plug-and-go design. Programming is simple with our interactive motion control programs, and a DOS command-line interpreter is included with the system — thus increasing productivity for small manufacturers, laboratories, and universities.

Our line of affordable automation products makes it easy to tackle projects that would otherwise require a substantial investment in engineering. Science and industry can use these products to minimize design effort and shorten development cycles on projects requiring intelligent motion. Universities and vocational schools can use them to teach motion control theory or simulate plant automation — without even needing to open your PC.

Our **MD2** Stepper Motor Systems are completely compatible with our MCS tables & slides product line. Up to 6 motors (three MD2 systems) can be connected to your PC for multi-axis projects. The MD2 can control our MCS X-Y and rotary positioning tables. The rotary table can be attached to the X-Y table, and the X-18 linear positioning table can mount to the rotary table (see facing page).

Software Included Free

Each MD2 system comes with our DOS-based MD2 motion control software, providing complete control of up to 6 motors from a single PC. Motor speed, travel distance, limits, units, and other parameters can be edited easily and saved to disk. Single and dual-motor moves are easily accomplished; even linear and circular interpolation are possible. The powerful TEACH mode feature creates programs *automatically* as you control motors via the keyboard or joystick. A complete set of subroutine libraries are included to allow creation of custom programs in BASIC, C, Pascal, QBASIC, QuickBASIC, and Visual Basic. Integration with data acquisition and other PC-based control products can also be accomplished.

Three MD2 Models to Choose From

There are 3 different MD2 models to choose from to fill a variety of torque and resolution requirements. Each MD2 System contains 2 stepper motors, 2 home switches, 2 10-foot motor cables, a printer port cable, the driver/power supply box, software, and extensive documentation. The system can be powered by a 115VAC outlet or from any 28VDC supply (call for information on 220VAC power options). All you need is an IBM-compatible PC with a parallel printer port. All models also have an input/output port which gives the user 2 digital outputs and 3 digital input lines for controlling relays and interfacing with sensing devices. No cards to install, no cables to build, & no components to match — our easiest-to-use series of motor control systems.

Ordering Information: **Fax-on-Demand Info: 203-483-9966 – FOD#5520**

#CMS MD2A MD2A Dual Stepper Motor System, 50 oz-in.....**$699**
#CMS MD2B MD2B Dual Stepper Motor System, 150 oz-in.....**$999**
#CMS MD2C MD2C Dual Stepper Motor System, 300 oz-in.....**$1399**

Each MD2 Series System contains 2 stepper motors, 2 home switches, 2 10' motor cables, printer port cable, driver/power supply box, software, and extensive documentation. Each controller may be run off of a 28VDC power supply via 2 screw terminals on the back.

CMS MD2A: $699

The MD2A is our basic dual-axis motor control package. It controls 2 motors (2 axes of control), and is ideal for use with our MCS-series of slides & positioning tables. The MD2A comes complete with motors, power supply, stepper motor driver/controller box, and cables.

Motors: Size #23
2.25" body diameter
2.25" long
0.25" shaft diameter
0.75" shaft length

Torque: 50 oz-in holding torque.

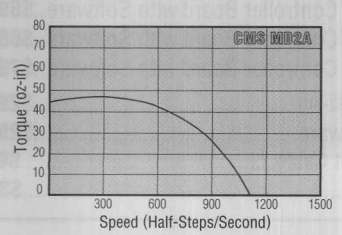
Resolution: 0.9-degree steps (400 steps per revolution) in half-step mode.

Speed: 1000 half-steps/second in start/stop mode under no load, *10,000 w/ramping.*

Input/Output Port: *3 digital inputs, 2 outputs*

Shipping Weight: 12 lbs.

Compatibility: The MD2A can be used to drive any of our **MCS**-series linear or rotary positioning tables (pg. 91).



CMS MD2B: $999

The MD2B has *3 times the torque* of the MD2A. This makes it an ideal choice for use with our positioning tables – great for moving larger payloads faster. The MD2B comes as a complete package, including motors, cables, and more.

Motors: Size #23
2.25" body diameter
4.00" long
0.25" shaft diameter
0.75" shaft length

Torque: 150 oz-in holding torque.

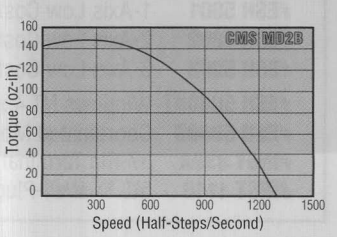
Resolution: 0.9-degree steps (400 steps per revolution) in half-step mode.

Speed: 1000 half-steps/second in start/stop mode under no load, *10,000 w/ramping.*

Input/Output Port: *3 digital inputs, 2 outputs*

Shipping Weight: 15 lbs.

Compatibility: Use the MD2B with our MCS series of X and X-Y tables (page 91). The MD2B is *not compatible* with our RT12 rotary table or BR2 (due to motor length).



CMS MD2C: $1399

The MD2C utilizes larger, size 34 motors to deliver 6 times the torque of our MD2A. It's ideal for use in positioning *large payloads,* but it is *not compatible* with our MCS-series tables (see the size 23 & 34 diagrams on page 96).

Motors: Size #34
3.4" body diameter.
3.75" long
0.375" shaft diameter
1.25" shaft length

Torque: 300 oz-in holding torque.

Resolution: 0.9-degree steps (400 steps per revolution) in half-step mode.

Speed: 1000 half-steps/second in start/stop mode under no load, *10,000 w/ramping.*

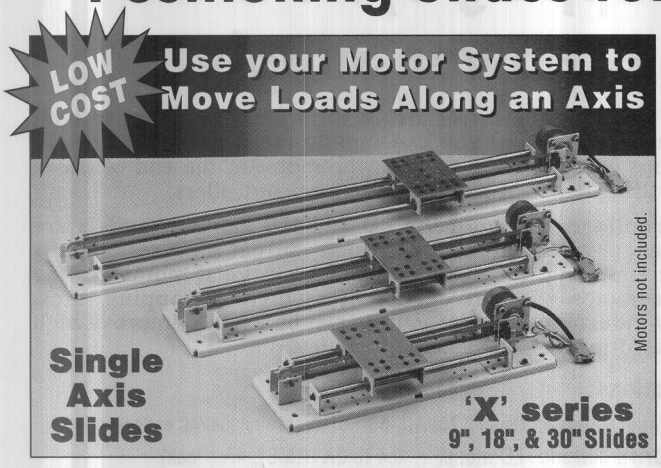
Input/Output Port: *3 digital inputs, 2 outputs*

Shipping Weight: 22 lbs.

Compatibility: Our MD2C *cannot be used* with our MCS series of linear or rotary positioning tables due to motor size. It is best for large-payload systems.

CyberResearch Assistance: Toll-Free 1-800-341-2525 (USA) Tel: 203-483-8815 Fax: 203-483-9024
Applications Engineers: Mon-Fri, 9AM-5PM U.S. Eastern Time • **Internet Website:** http://www.cyberresearch.com • **Fax-on-Demand System:** 203-483-9966 • **BBS:** 203-488-8949

Positioning Slides for Educators & Experimenters



Lightweight, Easy-to Use, Accurate

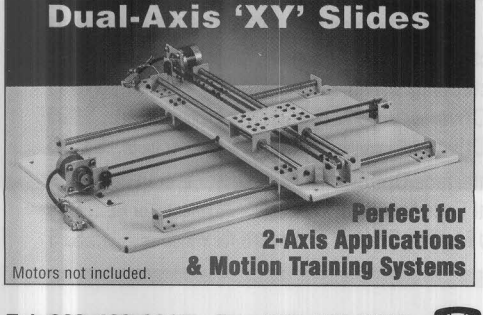
Would you like to automate a task but don't know how? Our new positioning tables make it easy! Combining one or more of these tables with your stepper motor system can provide the mechanical interface between the motors and your application. All of these tables and slides offer reliable, accurate motion control at a remarkably affordable price. They're the perfect choice for educators and hands-on training systems.

Applications

- Automated Testing
- Sensor Positioning
- Light-Duty Machining
- Pick & Place Operations
- Dispensing
- Training
- Lab Automation

'X' Single-Axis Positioning Tables

Now it's easy to position sensors, automate pick-and-place operations or perform light-duty machining. Our new 'X' series belt-driven positioning tables are the perfect alternative to traditional lead-screw driven tables. The low-stretch timing belt provides a ±0.01" per foot accuracy at speeds rivaling lead-screw models. All our 'X'-series tables can be controlled easily with our **CMS MD2A** or **B** stepper motor systems (pg 90) — just attach the motor and connect the home switch; even the tools are included. The 4" x 6" top plate on each slide has 15 mounting holes to attach your instrument or tool. An aluminum frame, polished steel shafts, and bronze bearings make our 'X'-series positioning tables lightweight, accurate, and affordable. Note that motors are not included in the price of any of the products listed here. For motors and our complete motion systems, see pages 88, 90, and 96.



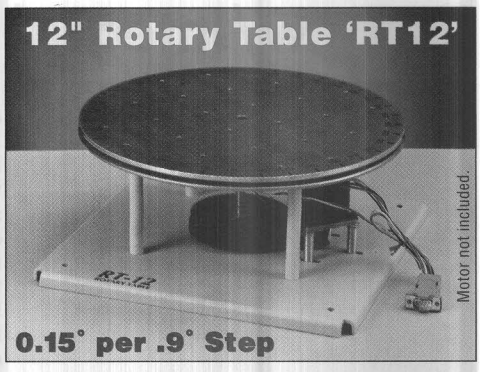
Complete Workcells

A complete multi-axis automation workcell can be created by connecting our Z axis to an 'XY' table. In many cases, an XYZ configuration can replace a very elaborate robotic system at a fraction of the cost. Gantry operation of the positioning table is possible using our ST series mounting stands.

Z-Axis Positioning Table

Do you need the precision of a lead-screw? Need short travel against gravity? Our Z2 table can solve the problem. Constructed with an aluminum frame, precision ground lead-screw, and a low backlash acme nut, the Z2 is perfect for short X, XY, and XYZ applications. It can be easily attached to our X and XY tables using the SK4 spacer kit (horizontal) or the BR2 bracket kit (vertical). Connect the Z2 to an X9 slide to make an XY table with 9 inches of travel in one direction and 2 inches in the other. Connect 3 Z2 tables together to create a 3-axis workcell.

This modular system makes it easy to use and re-use these parts for different applications — simply bolt the parts you need together and you're on your way.



Rotary Positioning Table

We've designed a rotary positioning table using our unique, cost-effective philosophy. The RT12 can be used to position a variety of payloads such as cameras or lasers. The 12" diameter aluminum top plate has 24 tapped holes to attach your load. An endless variety of configurations can be created by attaching a linear positioning table such as our Z2 or X9 to the RT12.

Stands for Positioning Table

Many applications require gantry (upside down) operation of positioning systems. Our 'ST' stands are made to fill this need. They're constructed of strong, welded steel tubing for minimum vibration and flex.

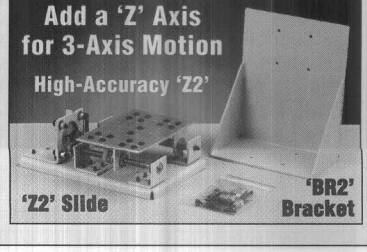
Ordering Information: ***Motors not included.*** **Call Fax-on-Demand for more info: FOD#5524**

#MCS X9	Single-Axis 9" Linear Positioning Table (±.010"/ft; 0.005" per .9° step; max 4"/sec)	**$395**
#MCS X18	Single-Axis 18" Linear Positioning Table (±.010"/ft; 0.005" per .9° step; max 4"/sec)	**$445**
#MCS X30	Single-Axis 30" Linear Positioning Table (±.010"/ft; 0.005" per .9° step; max 4"/sec)	**$745**
#MCS XY9	Dual-Axis 9" Linear Positioning Table (0.005" per .9° step; max 2"/sec X, 4"/sec Y)	**$745**
#MCS XY18	Dual-Axis 18" Linear Positioning Table (0.005" per .9° step; max 2"/sec X, 4"/sec Y)	**$845**
#MCS XY30	Dual-Axis 30" Linear Positioning Table (0.005" per .9° step; max 2"/sec X, 4"/sec Y)	**$1495**
#MCS Z2	Single-Axis 2" Linear Positioning Table (±.005"/ft; 0.00125" per .9° step; max .5"/sec)	**$395**
#MCS BR2	Right angle bracket to attach Z2 to other tables (for vertical mounting of Z2)	**$74**
#MCS SK4	Spacer kit to attach Z2 to other tables (for horizontal mounting of Z2)	**$24**
#MCS RT12	Rotary 12" Positioning Table (±0.1°; 0.15° per 0.9° step; max speed 45°/sec)	**$295**
#MCS GR2	Dual Finger Gripper – ½-lb Grip (.5" closed, .88" open); uses size 23 motor; .019"/.9° step	**$245**
#MCS ST9	Gantry (upside-down) Stand for XY9 (makes it easy to handle 3-dimensional tasks)	**$345**
#MCS ST18	Gantry (upside-down) Stand for XY18 (makes it easy to handle 3-dimensional tasks)	**$345**

All specifications above are for a 2 lb. payload. Payloads up to 15 lbs. may be used. Perfect for experimenters & educators.

Dual-Axis Positioning Table **Call Fax-on-Demand 203-483-9966 for more info.**

Designed from our 'X'-series positioning tables, the 'XY' series (shown at left) can be used for a variety of automation applications. Two degrees of freedom allow more complex, two-dimensional tasks to be performed, such as positioning a paint gun or plotting graphs. The aluminum frame makes each table strong and lightweight, while the solid steel shafts and bronze bearings provide accuracy (±.01") and long life with a minimum of flexure. Our 'XY' series tables can be driven using size 23 motors, such as those included with our CMS motion systems (page 90). The software included with each CMS motor system will automatically compensate for any belt stretch, resulting in increased accuracy. A home switch attached to each axis provides feedback to the controller, giving the software a reference point for all positioning commands. Use our 'XY' series tables with the 'Z2' table (shown at right) for 3-axis positioning tasks. Add one of our steel stands (not shown) for gantry operation (upside down).



Panther™ Series Microstepping System w/Integral Motor Driver & Power Supply

The **Panther LD** is a high performance, 3 Amp/phase low cost microstepping driver with integral power supply that incorporates advanced surface mount and ASIC technology. The Panther LD is small, easy to interface & use, yet powerful enough to handle the most demanding stepping applications. Our **Panther HD** model can handle up to 7 Amps.

The Panther LD & HD models allow you to change the number of microsteps per step *at any time.* There is no need to reset the driver. Built into the driver are 14 different resolutions in both binary and decimal, so you can rapidly move long distances in large steps, yet precisely position the motor at the end of travel without the expense of high-performance controllers.

Incorporated into both the **LD** and **HD** Panther models are proprietary circuits that minimize ripple current while maintaining a 20kHz chopping rate. This prevents additional motor heating that is common with drivers requiring higher chopping rates. Now low-inductance stepper motors can be used to improve high speed performance and system efficiency.

Specifications:

Input Voltage:	90 to 128VAC, 50/60 Hz (180 to 264VAC optional on HD)
Drive Current:	LD model — 0.4 to 3A (RMS), 4A (Peak) HD model — 2 to 7A (RMS), 10A (Peak)
Isolated Logic Inputs:	Step Clock, Direction, Enable, Reset.
Step Frequency (Max):	10 MHz; Motor Speed: 0 to 6000 RPM
Step Resolutions:	400, 800, 1000, 1600, 2000, 3000, 5000, 6400, 10000, 12800, 25000, 25600, 50000, 51200 per revolution
Dimensions:	***LD model:*** 2.6" x 3.9" x 4.4"; ***HD model:*** 4.0" x 6.7" x 4.4"
Protection:	Thermal and All-Way Short Circuit (HD model includes over/under-voltage protection).

Ordering Information: **Fax-on-Demand Info: 203-483-9966 – FOD#5650**

#PANT LD 3-Amp Panther LD Microstepping Driver & Power Supply **$595**
#PANT HD 7-Amp Panther HD Microstepping Driver & Power Supply....**$995**

Complete Motor System-in-a-Box: Panther w/ Built-In Controller and Encoder Feedback

If you do not have an available slot in your PC to add a stepper motor controller card, our New Remote Panther Series modules might be the solution for you. These modules attach directly to the RS-422/485 port of your PC (RS-232 optional).

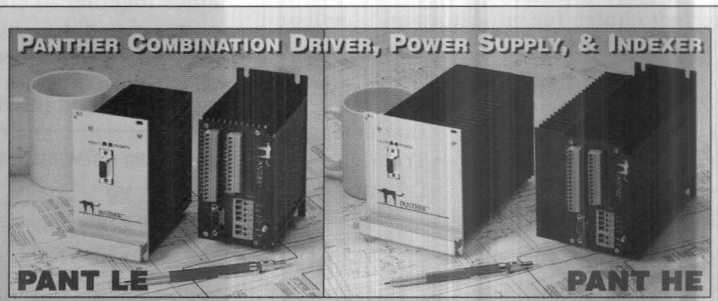
The **Panther LI and LE** models support 3 Amps per phase, while our **Panther HI** & **HE** support up to 7 Amps RMS. These models include the same advanced features as our HD and LD modules above, with the added support of an integral controller and encoder feedback. A built-in +5V supply makes it easy to set up limit switches, etc. To build a simple motion system **just add a motor, AC power, and connect it to your PC's serial port.**

The Intelligent Indexer (Controller)

The built-in indexer, found on all of the models in this Panther Series, allows the user, via a serial link, to program parameters such as acceleration/deceleration ramps, velocity, position, resolution, drive current, etc., to form simple or complex motions. Programs can be executed by sending single commands, or can be stored in the on-board nonvolatile memory (2KBytes) which can then be executed on power-up or by discrete user inputs. The indexer has a variety of built in functions. Some of these include limit switches, a homing algorithm, as well as general-purpose inputs and outputs that can be used to detect switch closures and to activate solenoids and other external devices.

Encoder Feedback

The Panther **LE** and **HE** models include an integral indexer and encoder feedback. With the encoder feedback, these modules



can be used to enhance system performance by adding complex functions such as position verification, maintenance, and stall detection. These functions can be of particular importance with systems requiring closed-loop control. Circuitry for single-ended encoder signals is built-in, with differential encoder input optional.

Specifications:

Input Voltage:	90 to 128VAC, 50/60 Hz (180 to 264VAC optional)
Drive Current:	LI & LE Models — 0.4 to 3A (RMS), 4A (Peak) HI & HE Models — 2.0 to 7A (RMS), 10A (Peak)
Isolated Logic Inputs:	Limit A, Limit B, Home, Party
Serial I/O Baud Rate:	9600 Baud, RS-422/485 (RS-232 optional)
Operating Temperature:	0 to 60°C; Storage Temperature: –40°C to +125°C
Step Frequency (Max):	10 MHz; Motor Speed: 0 to 6,000 RPM
Step Resolutions:	400, 800, 1000, 1600, 2000, 3000, 5000, 6400, 10000, 12800, 25000, 25600, 50000, 51200 per revolution
Dimensions:	LI & LE Models — 2.6" x 3.9" x 4.4" HI & HE Models — 4.0" x 6.7" x 4.4"
Digital I/O Lines:	3 Inputs (0 to +5VDC) & 3 Outputs (0 to +5VDC)
Encoder Resolution:	50 to 12750 Lines (in 50-Line Increments)

QuickSTEP II™ Windows Indexing Software

QuickSTEP II is a powerful software package for on & off-line creation and editing of programs to control our Panther, SMD 483I, & SMD 1007I modules with controllers. The full-featured editor makes creating and modifying a program easy & simple. Position can be input as steps, or with the prescaling feature as inches, centimeters, angles, etc., and will be converted into motion commands automatically. Graphical profile plotter included. Programs are easily down-loaded directly to the controller. **FOD# 5630**

Ordering Information: **Fax-on-Demand Info: 203-483-9966 – FOD#5652**

#PANT LI 3A Microstepping Driver with Power Supply & Indexer.....**$795**
#PANT HI 7A Microstepping Driver with Power Supply & Indexer...**$1095**
#PANT LE 3A µstep Driver w/Controller, Pwr Supply, & Encoder Input **$895**
#PANT HE 7A µstep Driver w/Controller, Pwr Supply, & Encoder Input...**$1195**
#PANT 232 RS-232 Interface Option for Panther LI, HI, LE, or HE **$75**
#PANT DE Differential Encoder Input Option for Panther LE or HE....**$75**
#SMS 100 *QuickStep* Motion Control Software for Windows **$75**

CyberResearch Assistance: Toll-Free 1-800-341-2525 (USA) Tel: 203-483-8815 Fax: 203-483-9024
Applications Engineers: Mon-Fri, 9 AM-5 PM U.S. Eastern Time • **Internet Website:** http://www.cyberresearch.com • **Fax-on-Demand System:** 203-483-9966 • **BBS:** 203-488-8949

New, All-in-One Stepping Driver Combines Amplifier and Indexer in Compact Package

Our intelligent microstepper/drivers are based on a revolutionary design, creating a highly integrated system in an extremely small package. This design (which is also used in our Panther series drivers on the facing page) offers several improvements over both stepping motor drivers and stepping controllers of the past:

- As microstepping drivers these stand far above the crowd by offering microstepping resolutions finer than any others.
- As intelligent stand-alone controllers, each of these models combines the functions of a stepping motor controller directly onto the driver package. No boards need be installed in your PC. At an incremental cost of only $200 per axis, the controller functions **cost less than PC-based controllers**, while affording you the flexibility to **purchase only the axes you need.**

I-Versions: On-the-Fly Variable Microstepping Controller

Our **SMD 483I** and **SMD 1007I** microstepping drivers deliver superior stepping performance through the use of a new technology called "Variable Resolution Microstep Control." At low shaft speeds, **VRMC** produces high resolution microstep positioning for silent, resonance-free operation. As shaft speeds increase, the step resolution is expanded using "on-motor-pole" synchronization. At the completion of a move, the target position is trimmed to 1/100th of a step, achieving maximum positioning accuracy.

Economical Approach — Buy only the Axes you Need

Older motion systems used large, expensive, and clumsy indexers, while newer systems often use PC-based intelligent controllers. The design of these units incorporates the best of those worlds by putting a single-chip intelligent controller directly onto the stepping motor driver. Choose from 3 options:

- A micro-stepping driver/amplifier which receives clock and direction signals from a PC-based stepping controller (several models shown on the next page, including the **SMD 483**).
- All the above functions plus an on-board controller and non-volatile memory which provide intelligent stepping control. (**I**)
- All above functions plus encoder interface which allows you to do real-time closed-loop control. (**IE** version)

Easy ASCII Programming from any Language

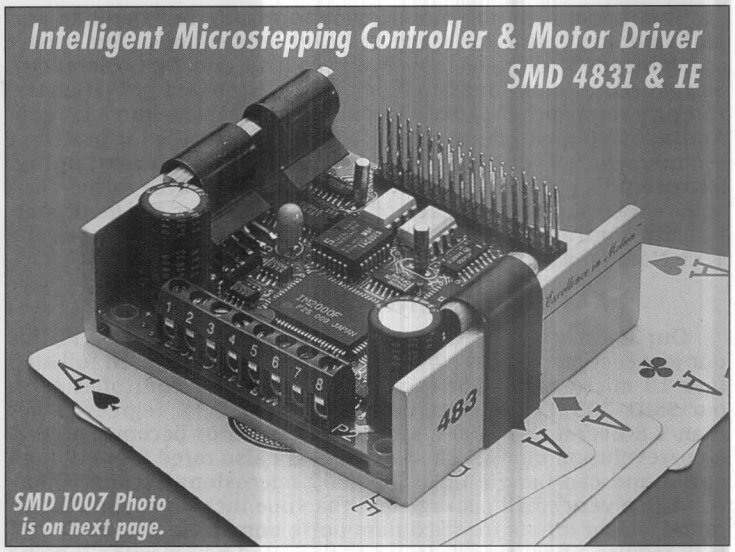
All operations are accomplished using single letter ASCII commands followed by 1 or 2 numerical data ranges. These statements can be downloaded to the controller using simple output commands from any programming language, or by using popular, low-cost communications software. Each driver incorporates an on-board RS-422 port for reliable twisted-pair communications. RS-422 is a common industrial standard for serial communications which is identical to RS-232 in software, but which uses differential transmission for noise immunity and longer transmission distances.

High-level software is available for a nominal charge which will help you come on-line sooner, and help to simplify your software development. **QuickStep**™ is a Windows-based package which allows you to communicate with your driver/controller without doing any programming. You can easily test to see that your motors are installed and operating properly, and you can execute simple motion profiles.

Operate in Interactive or Stand-Alone Modes

Applications for these products will typically involve operation in one of two modes:

- Interactively communicate with the on-board indexer through a PC interface, much like operating using a PC-board controller.
- Design the **SMD 483/1007** directly into a machine. Its small size, light weight, and highly integrated electronics make it ideal for this application. These drivers can run unattended in stand-alone mode, yet they are easily modified by simply downloading new commands via the RS-422 port.



SPECIFICATIONS:	SMD 483I & IE	SMD 1007I & IE
Input Voltage	+12 to 48VDC	+24 to 80VDC
Drive Current/phase	0.4 to 3A RMS, 4A Peak	2 to 7A RMS, 10A Peak
Dimensions	2.75"W x 3"L x 1.2"H	3"W x 5.87"L x 1.125"H
Sugg. Power Supply	#MSS 40-04	#MSS 75-04 or MUS 80-06
Operating Temp	Case: 0 to 70°C	Case: 0 to 60°C
Storage Temp	−40 to +125°C	−40 to +125°C
Isolated Logic Inputs	Limit A, Limit B, Home, Party	
Motor Speed	0 to 6,000 RPM	
Step Frequency	20 kHz max	
Step Resolutions (steps/rev)	Auto-Variable (software-switchable on-the-fly) 200, 400, 800, 1000, 1600, 2000, 3200, 5000, 6400, 10000, 12800, 25000, 25600, 50000, 51200	
Position Counter	±8,388,607.99	
Non-Volatile Memory	2 KBytes	
Baud Rate	9600 Baud	
Dedicated Inputs	Five, 0 to +15V (GO, JOG+, JOG-, JOG SPEED, SOFT-STOP)	
General Purpose I/O	Three Digital Inputs/Three Digital Outputs (TTL)	
Encoder Resolution	50 to 12750 Lines (in 50-line increments)	
Protection	Thermal & All-Way Short Circuit	

Ordering Information: **Fax Info: 203-483-9966 – FOD#5648** & **5658** (1007)

#SMD 483I	48V, 3A Microstepping Driver w/Controller	**$495**
#SMD 483IE	48V, 3A Microstep Driver w/Controller & Encoder Input	**$595**
#SMD 1007I	80V, 7A Microstepping Driver w/Controller	**$795**
#SMD 1007IE	80V, 7A Microstep Driver w/Controller & Encoder Input	**$895**
#SMS 100	*QuickStep* Motion Control Software (see page 191)	**$75**
#SMD 232	RS-232 Interface Option for SMD 483I/IE or 1007I/IE	**$75**
#SMD DE	Differential Encoder Input Option for 483IE or 1007IE	**$75**
#INST 345A	34-Pin Screw Terminal Block with 6-inch Cable	**$79**
#COMT 265	Optically-Isolated RS-232 to RS-422 Converter	**$142**
#BLS 4221S	RS-422/485 Communications Board (page 83)	**$109**
#BLS 4222S	Dual RS-422/485 Communications Board for PC	**$129**

Microstepping Drivers for Smooth Motion

The driver is the critical link in your motion control system between the controller and the motors. Choosing the right driver is essential to getting the performance you require.

Traditional stepping motor operation using full-stepping and half-stepping is fine for many ordinary applications. But it isn't recommended for precision motor control and fine tolerances. Slow-speed motion tends to "cog" with a "stop-and-go" jerkiness. Hitting a resonance frequency can throw your system into a tailspin. And full-step positioning accuracy is not acceptable for precision requirements. The solution to these problems is **microstepping**. Microstepping drivers generate a pair of sine waves rather than square waves. That way each phase of your motor can be proportionally controlled, rather than just turned off and on. See the Tech Note on page 191 for a more detailed explanation.

Microstepping Drivers Eliminate Resonance

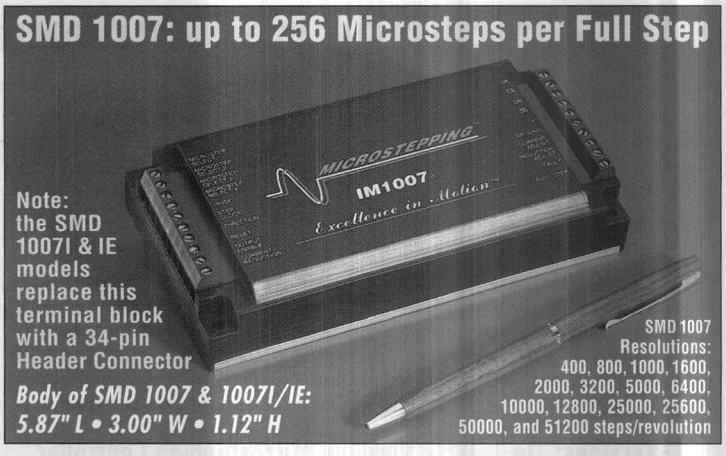
Our microstepping drivers are bipolar chopper drivers like our low-cost models below. In addition, they divide each full step into 10 microsteps. For each pulse from your controller card, our **SMD 703/707** drivers move the motor 0.18 degrees rather than 1.8 degrees. A 200 step/revolution motor becomes a 2000 step/revolution motor. These drivers are also rated for very high speed and can handle up to 500,000 microsteps/second. They come in a very small package less than one inch high, and feature opto-isolated inputs for maximum noise immunity. The **SMD 707** may require a heat sink if driven at full rated power without being mounted to a chassis. This highly-reliable design features:

- High efficiency MOSFET drive transistors.
- 24 to 60VDC input for high-speed operation.
- Optically-isolated step & direction inputs for high noise immunity.
- 30 kHz PWM switching frequency.
- Reduced current during idle (with external logic).
- Operating temperature –20 to +50°C and 100Gs shock rating.

Ordering Information: **Fax-on-Demand Info: 203-483-9966 – FOD#5610**

#SMD 703 24-60V, 0.75-3.6A Microstepping Driver (10 µsteps/Full Step)...**$450**
#SMD 707 24-60V, 1.5-7A Microstepping Driver (10 µsteps/Full Step).....**$495**
#SMD 710 Heat Sink for SMD 700-series Drivers **$35**

SMD 1007: up to 256 Microsteps per Full Step



Note: the SMD 1007I & IE models replace this terminal block with a 34-pin Header Connector

Body of SMD 1007 & 1007I/IE: 5.87" L • 3.00" W • 1.12" H

SMD 1007 Resolutions: 400, 800, 1000, 1600, 2000, 3200, 5000, 6400, 10000, 12800, 25000, 25600, 50000, and 51200 steps/revolution

High-Resolution Driver offers up to 51,200 steps/revolution

Our high-resolution microstepping driver is capable of **up to 256 microsteps per full-step**. This gives you the ultimate in positioning accuracy and smooth motion without resonance — up to 51,200 steps per revolution. Our intelligent controllers (page 89) support this ultra-fine microstepping. (**SMD 483** photo, page 93). These drivers offer many impressive features, including:

- 14 User-selectable microstep resolutions (via 4 TTL I/O lines).
- 10 million microsteps per second output (10 MHz).
- On-the-fly resolution changes without interruption of motor. (Switch from full to microstepping for maximum performance.)
- Current, voltage, short-circuit, and temperature protection.
- 2 to 7 Amps per phase current drive (SMD 1007); (0.4–3A for 483).
- 24-80VDC input for high-speed operation. (12–48V for SMD 483).

Ordering Information: **Fax-on-Demand: 203-483-9966 – FOD#5647, 55, & 57**

#SMD 483 12-48V, 3A Microstepping Driver (2-256 Microsteps/Full Step)...**$295**
#SMD 804 24-75V, 4A Microstep. Driver (high-power version, looks like 483)..**$450**
#SMD 1007 24-80V, 7A Microstepping Driver (2-256 Microsteps/Full Step)...**$595**

High-Performance Bipolar Chopper Drivers

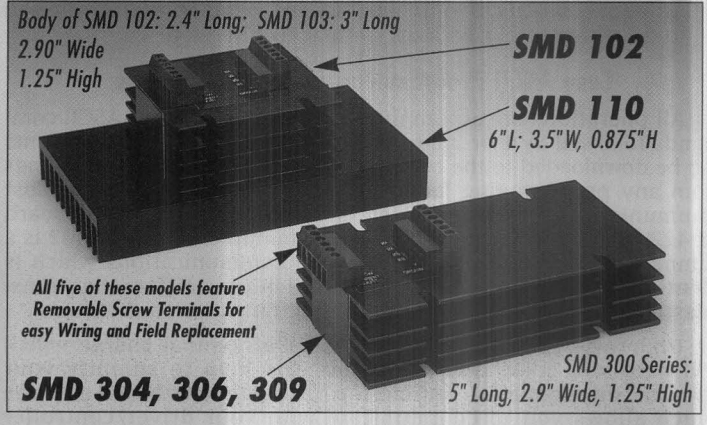
Using bipolar chopper technology, these are the low-cost drivers which have made L/R drivers obsolete. They get your motors up to rated speed quickly and efficiently. (See our large handbook for a better discussion of this technology.) Our popular **SMD 102** & **103** drivers are rated for up to 40,000 steps/second The **SMD 304, 306, and 309** are rated in the ultra-fast range attained by few other stepping motor drivers: 250,000 steps/sec.

A 20 kHz chopping rate eliminates all audible noise, and all inputs are optically-isolated for noise immunity. All models are electronically selectable between full and half-step, letting you change on-the-fly without mechanical adjustments. These drivers pack a tremendous amount of power into a miniature drive: the **SMD 309** puts out 1800W of power from a six cubic inch package. A heat sink (**SMD 110**) is required to run an **SMD 102** or **103** driver near rated output without mounting it to a chassis.

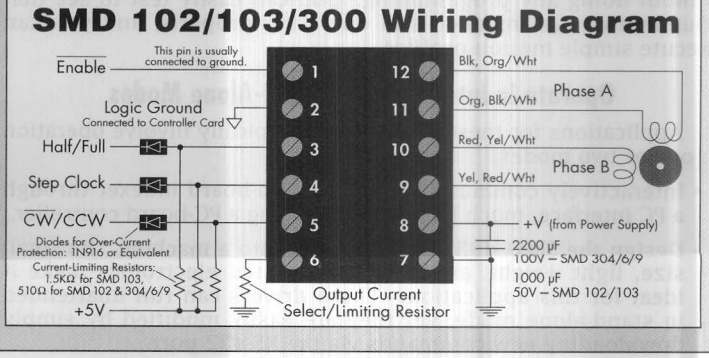
SMD 102 and **SMD 103** drivers make a good match with the lower current requirements of our Size 23, high-speed motors. **SMD 304, 6, & 9** drivers can handle up to 4, 6, or 9A output current, making them a good match for our high-torque, size 34 motors.

Ordering Information: **Fax-on-Demand Info: FOD#5602, 5603** (300 series)

#SMD 102 12-40VDC, 2-Amp Bipolar Chopper Driver.....**$125**
#SMD 103 12-40VDC, 3.5-Amp Bipolar Chopper Driver.....**$195**
#SMD 110 Heat Sink for SMD 100 series Drivers.....**$35**
#SMD 304 24-80VDC, 4-Amp Bipolar Chopper Driver.....**$225**
#SMD 306 24-80VDC, 6-Amp Bipolar Chopper Driver.....**$275**
#SMD 309 24-80VDC, 9-Amp Bipolar Chopper Driver.....**$350**



SMD 102/103/300 Wiring Diagram

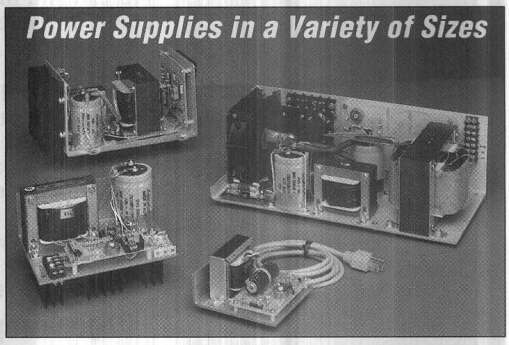


CyberResearch Assistance: Toll-Free 1-800-341-2525 (USA) Tel: 203-483-8815 Fax: 203-483-9024
Applications Engineers: Mon-Fri, 9 AM-5 PM U.S. Eastern Time • **Internet Website:** http://www.cyberresearch.com • **Fax-on-Demand System:** 203-483-9966 • **BBS:** 203-488-8949

Top-Quality Power Supplies for your Motor System at Great Prices — Why Settle for Less?

The power supply is a very important element in your motor control system. Providing enough power for a high-performance system is quite a job. Our **SMD 306** chopper driver, for example, can pull 1200 watts for a single motor! While none of our other power supplies provide quite that much power, we offer models to match the most common applications.

Check our chart of stepping motors for current requirements. Stepping motors are primarily current-driven. It is important to provide rated current to the motors to get maximum performance. The voltage level at which the current is delivered is a secondary consideration. The speed/torque curves on page 96 help to illustrate this fact. Performance is nearly identical for either 30V or 60V supplies until you get into the tail-end of the curve.



Ordering Information: **Fax-on-Demand: FOD#5715**

#MPS 15-01 15VDC, 1.2A Power Supply.....**$60**
#MPS 15-06 15VDC, 6A Power Supply.....**$125**
#MPS 15-09 15VDC, 9A Power Supply.....**$195**
#MPS 15-18 15VDC, 18A Power Supply.....**$375**
#MPS 18-02 18VDC, 2.5A Power Supply.....**$100**
#MPS 24-15 24VDC, 15A Power Supply.....**$375**
#MPS 28-01 28VDC, 1A Power Supply.....**$60**
#MPS 28-04 28VDC, 4A Power Supply.....**$125**
#MPS 28-07 28VDC, 7A Power Supply.....**$195**
#MPS 28-15 28VDC, 15A Power Supply.....**$375**
#MPS 30-02 30VDC, 2A Power Supply.....**$100**
#MPS 48-04 48VDC, 4A Power Supply.....**$195**

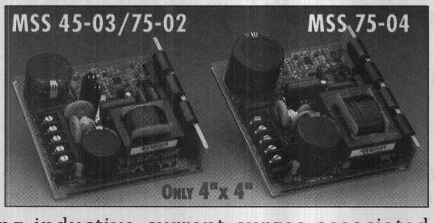
Are These Power Supplies Overkill?

We supply only top-quality, regulated DC power supplies. They're rated for .005% line regulation with less than 500 µvolts ripple. Recovery time is 25 microseconds with zero overshoot at turn-on and turn-off. Some people might think these specs are overkill for powering a motor system. But we believe that a high-quality power supply will save you needless problems. And since our prices are competitive with totally unregulated power supplies, *and* we can offer delivery on most of these models off-the-shelf, **why settle for anything less**?

Perfect for harsh environments, these supplies can accept AC power from 105 to 125VAC, 50 to 420Hz. (Our models **MPS 28-15, 24-15,** & **MPS 15-18** are designed for 50-60Hz only). Versions for 230VAC are available — call for information.

These power supplies are equally well suited for use with servo motor systems, built to meet demanding high current and high voltage requirements. *Our Panther™ integrated driver units on pg. 92 feature built-in power supplies matched with drivers.*

Compact Switching Power Supplies offer Higher Voltages in Smaller Spaces



Designed to supply power to inductive loads commonly found in stepping motors. Unlike the constant voltage of a typical switching DC supply, these units deliver *continuous current* while absorbing inductive current surges associated with stepping and DC motors; this enables motors to operate at even higher performance levels. They have built-in short-circuit & over-temperature protection circuits. Along with LEDs for fault and power, these circuits can aid in troubleshooting.

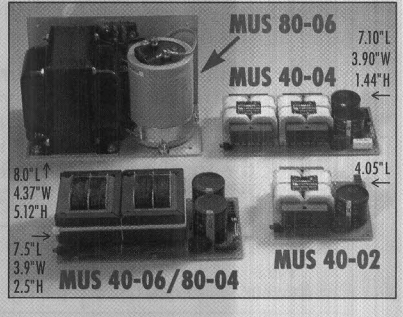
The compact size of these supplies makes them perfect for integration into OEM equipment. Our **MSS 45-03** and **MSS 75-02** provide 150W of continuous power in a 3.9" x 4.0" x 1.5"H package. The **MSS 75-04** supply provides 250W continuous, 300W peak in a 4.4" x 4.0" x 1.6"H space.

Specifications: Operating: 0 to 50°C (32°F to 122°F)
Storage Temperature: –40°C to 125°C (–40°F to 257°F)
Max. Heat Sink Temp.: 70°C (158°F)
Output Power – MSS 45-03: 45VDC (Nom.), 3A Continuous
MSS 75-02: 75VDC (Nom.), 2A Continuous
MSS 75-04: 75VDC (Nom.), 4A Continuous
Input Voltage – 102 to 132VAC, 50/60Hz
(append **–H** to part# for 204-264VAC option)

Ordering Information: **Fax-on-Demand: 203-483-9966 – FOD#5727**

#MSS 45-03 45VDC, 3A Switching Power Supply.....**$195**
#MSS 75-02 75VDC, 2A Switching Power Supply.....**$195**
#MSS 75-04 75VDC, 4A Switching Power Supply.....**$295**

Low-Cost Unregulated DC Power Supplies: Raw Power for Tighter Budgets



Like the MSS-series power supplies (at left), our MUS units have been designed specifically for the power requirements of DC motion control applications. These are unregulated DC power supplies, built to provide plenty of raw power for high performance motor systems, at a lower cost — simple, reliable power.

Perfect Matches to our Most Popular Motor Drivers

Cut back to the bare-bones requirements sufficient for providing power to inductive loads, these units offer 40VDC or 80VDC (nominal, no-load) at 2A, 4A, or 6A of current. Our 40V models provide 80 to 240W of power – great for small, single-motor applications. At the other end, our **MUS 80-06 delivers nearly 500 watts of power** to drive your motion system. At 80VDC it can help coax the highest performance curve from your motors. It's a perfect match for our 80-volt bipolar chopper drivers and microstepping motor drivers, such as the **SMD 304, 306, 309,** and the **SMD 1007** series.

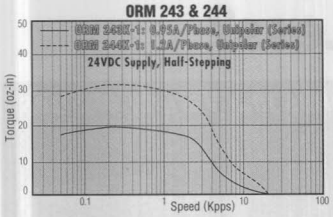
Ordering Information: **Fax-on-Demand: 203-483-9966 – FOD#5720**

#MUS 40-02 40VDC, 2A Unregulated DC Power Supply.....**$120**
#MUS 40-04 40VDC, 4A Unregulated DC Power Supply.....**$160**
#MUS 40-06 40VDC, 6A Unregulated DC Power Supply.....**$195**
#MUS 80-04 80VDC, 4A Unregulated DC Power Supply.....**$195**
#MUS 80-06 80VDC, 6A Unregulated DC Power Supply.....**$395**

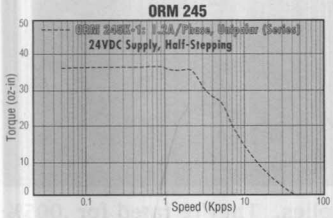
All models are designed for 115VAC, 50/60Hz. For 240V versions, append a **–H** to the part #.

Expanded Selection of Precision Stepping Motors

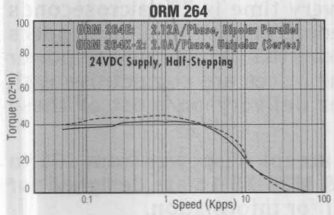
ORM 243 & 244



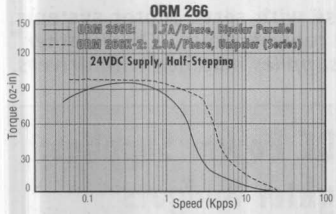
ORM 245



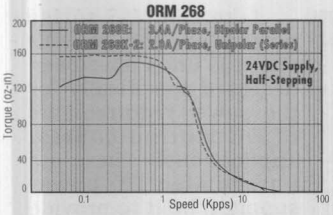
ORM 264



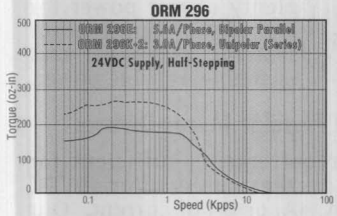
ORM 266



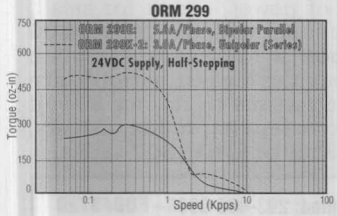
ORM 268



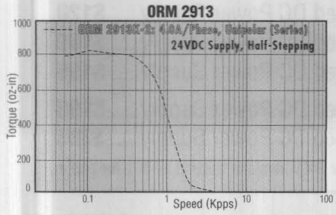
ORM 296



ORM 299



ORM 2913

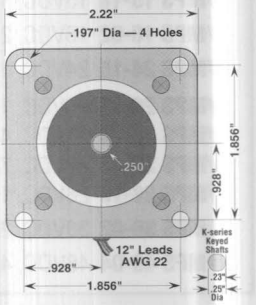


CyberResearch stepping motors make it easy to design most experimental, commercial and industrial applications. They come in three standard mounting sizes: NEMA size 17, NEMA 23, & NEMA 34. All motors are single-shafted, with double-shafted models available. In general, size 17 and 23 motors are well suited for high-speed applications where torque is a secondary consideration. Size 34 motors do not have the same speed ratings as some of the size 23 motors, but they can supply a great deal more torque at lower speeds.

Newer K-series Motors offer much Higher Torque in the Same Package

Designed to fit in the exact same space as their E-series counterparts, our new K-series motors offer improved load specifications and power efficiency. Sporting a new low-vibration, low-noise design, they feature a shaft keyed on two sides for easy, slip-free attachment of your load. For only a slight premium, these six-wire motors significantly out-perform other motors their size.

Size 23 Motor



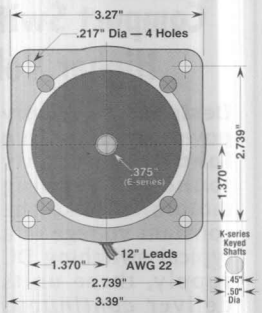
E-series 8-Wire Motors designed for Bipolar Parallel Operation

Our E-series motors are 8-wire motors. By splitting the center tap of the winding, you can now run your motion system in **bipolar, parallel** mode. "Bipolar" refers to the fact that both phases of your motor are driven at the same time. (See Motor Theory Tech Note on the facing page). "Parallel" refers to the fact that each winding is divided in half and the two halves are driven in parallel. This is more efficient than driving the full winding because the energy consumed by the winding increases as a square of its size. Parallel operation in effect gives you twice as many windings, each of which is smaller and more efficient. Motor performance is significantly improved over many older, 6-wire motors.

All of these motors have a 1.8° step size, for 200 steps per revolution. In half-step mode the step size becomes .9° for 400 steps/rev. Micro-positioning in .18° steps is possible when used with our microstepping drivers, which can produce 10 microsteps for each full step. Absolute positioning accuracy is rated at ±5% of one full step, or 1/2 of a microstep.

The accompanying speed/torque curves give you information which is vital to choosing the best motor for your application. The speed rating in the chart below, for example, tells you the speed at 20% of the holding torque. But the maximum speed at full torque might be much more crucial information. Be sure to check the torque scale at the left of the diagram. The scale varies for different motors. Also note that the speed scale on the x-axis is a logarithmic scale.

Size 34 Motor



Motor Specifications												
Part Number	Price	NEMA Size	Holding Torque (oz-in)	Speed* 20% Load (sps)	Current (Amps/phase) Series	Parallel	Unipolar Voltage (VDC)	mH per Phase	Ω per Phase	Shaft Len/Dia (in)	Length of Body (in)	# of Wires	Suggested Chopper Driver
#ORM 243K-1	$95	17	22.2	20,000	0.95	–	4.0	2.5	4.2	.71/.197"	1.30"	6	#SMD 102
#ORM 244K-1	$99	17	36.1	12,000	1.2	–	4.0	3.2	3.3	.71/.197"	1.54"	6	#SMD 102
#ORM 245K-1	$119	17	44.4	12,000	1.2	–	4.0	2.8	3.3	.71/.197"	1.85"	6	#SMD 102
#ORM 264K-2	$129	23	54.2	15,000	2.0	–	2.8	1.4	1.4	.73/.25"	1.54"	6	#SMD 103
#ORM 266K-2	$139	23	125	6,500	2.0	–	3.6	2.5	1.8	.73/.25"	2.13"	6	#SMD 103
#ORM 268K-2	$169	23	187	4,500	2.0	–	4.5	3.6	2.25	.73/.25"	2.99"	6	#SMD 103
#ORM 296K-2	$239	34	305	4,500	3.0	–	3.0	3.5	1.0	1.375/.5"	2.60"	6	#SMD 304
#ORM 299K-2	$349	34	611	2,000	3.0	–	4.2	6.0	1.5	1.375/.5"	3.78"	6	#SMD 304
#ORM 2913K-2	$499	34	916	1,500	4.0	–	3.8	4.2	0.97	1.375/.5"	4.96"	6	#SMD 306
#ORM 264E	$89	23	40.3	20,000	1.5	2.1	2.25	[1.5]	[1.5]	.75/.25"	1.54"	8	#SMD 103
#ORM 265E	$99	23	58.3	20,000	2.6	3.7	1.85	[0.9]	[0.72]	.75/.25"	2.01"	8	#SMD 304
#ORM 266E	$119	23	83.3	5,000	1.2	1.7	6.0	[8.0]	[5.0]	.75/.25"	2.13"	8	#SMD 102
#ORM 268E	$159	23	125	6,500	2.3	3.3	3.9	[3.0]	[1.7]	.75/.25"	2.99"	8	#SMD 103
#ORM 296E	$199	34	174	7,500	4.2	5.9	1.9	[1.5]	[0.46]	1.13/.375"	2.44"	8	#SMD 306
#ORM 299E	$249	34	306	3,000	4.0	5.6	3.0	[3.9]	[0.75]	1.19/.375"	3.68"	8	#SMD 306

* Speed for our E-series eight-wire motors is specified for bi-polar (parallel) operation, while our K-series motors are specified for unipolar (series) operation. All are specified using a 24VDC supply, at 20% of the Holding Torque, using half-stepping for smooth motion. Dividing the Speed by 200 (steps/rev) gives you the maximum speed in revolutions-per-second, loaded to 20% of the holding torque. Higher voltage supplies allow for greater maximum speeds. See the Speed/Torque curves at left for more detail. ***Shafts:*** *E-series motors have round shafts; K-series motors have round shafts keyed on two sides. Call for lead times on dual-shafted motors (**–B** option, $10).*

CyberResearch Assistance: Toll-Free 1-800-341-2525 (USA) Tel: 203-483-8815 Fax: 203-483-9024
Applications Engineers: Mon-Fri, 9AM-5PM U.S. Eastern Time • **Internet Website:** http://www.cyberresearch.com • **Fax-on-Demand System:** 203-483-9966 • **BBS:** 203-488-8949

Track Position & Direction with CyberResearch Quadrature Encoder Input Boards

Understanding Quadrature Signals

Tech Notes

Mike Mathis

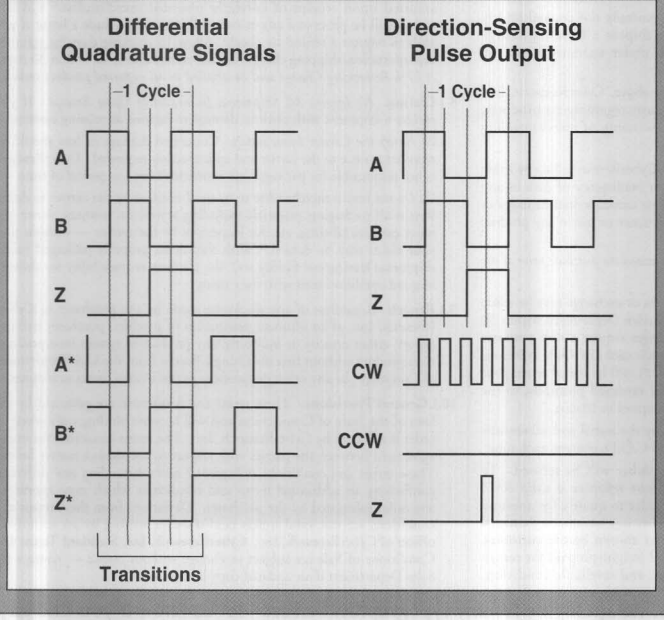
The output from incremental optical encoders and from many other types of measurement devices is known as a quadrature signal. A "Quadrature" signal consists of two square waves 90° out of phase. The input channel on our Encoder Interface Board counts the square wave transitions and determines direction by comparing whether channel "A" is leading channel "B" or vice-versa. The number of revolutions is determined by dividing the count by the number of pulses per revolution: e.g. 100 counts with a 1000 PPR (**P**ulses **P**er **R**evolution) encoder is equal to 36°. Velocity is computed the same way by counting the number of pulses per second.

A quadrature signal may be contrasted with a tachometer signal which has only one square wave output, and therefore does not provide any direction information. Tachometer signals can be misleading because if the tachometer stops on a transitional edge, vibration will cause your counter to continue incrementing.

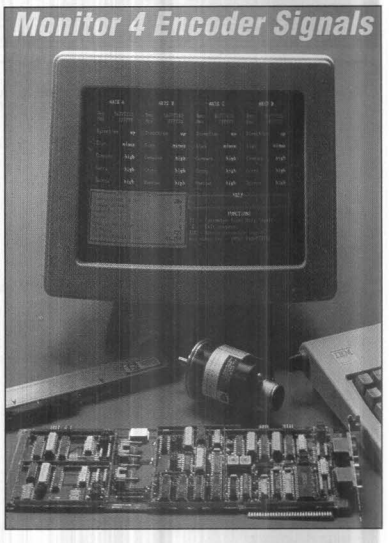
In addition to the two quadrature signals, most encoders supply an index signal with one pulse per revolution. Our Encoder Interface Boards (**ESH 251-254**, on this page) can use the index signal to reset the counter, allowing you to monitor your position within the current revolution.

Differential encoders provide a complementary signal for each of the three standard signals. Differential transmission prevents signal degradation in applications where the signal is to be sent over long distances. Each channel of our Encoder Interface Board can be programmed to accept differential or single-ended quadrature signals.

Our Encoder Interface Board can accept another type of encoder output as well: direction-sensing pulsed output. In this mode, the encoder generates a pulse for each of the four transitional edges of one quadrature cycle. Pulse output encoders will have clockwise and counter-clockwise signals in place of the "A" and "B" signals of the quadrature signal. Pulses will be generated on the CW line when "A" is leading, and on the CCW line when "B" is leading.



- Quadrature or pulse signals on each channel
- Choose from 1 to 4 input channels
- Single-ended or differential input signals
- 100%-Compatible with the Keithley MetraByte 5312 — for less!
- 1.33 MHz quadrature input pulse rate (up/down counting)
- Four-stage digital filter
- X1, X2, and X4 decoding



Programmable 24-Bit Counter Channels

24-bit counters maintain your count with accuracy of one part in sixteen million. Counters may be cascaded together in various ways, allowing such configurations as one 96 bit counter or one 24-bit counter with one 72-bit counter. The counters may be programmed for modes such as pulse and direction inputs as well as quadrature inputs. In pulse-&-direction mode, the maximum input rate is 10 MHz. This is much higher than the quadrature rate as encoders generate four counts for each quadrature cycle.

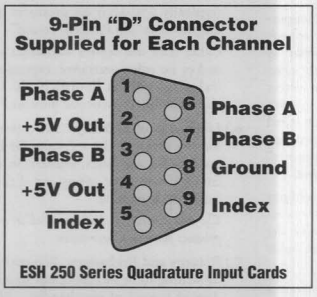
Four-Stage Digital Filter Improves Accuracy

Encoder signals are susceptible to noise since the waveforms are digital signals and encoders are often used in noisy environments. Using differential encoders will help to alleviate such problems, but additional filtering is sometimes required. Fortunately, our Encoder Interface Board contains a four-stage digital filter. Incoming signals must be valid high or low for at least 4 clock cycles. The clock frequency is adjustable up to 10 MHz. This filtering method produces a very sharp cutoff frequency while synchronizing all data transfers to the clock cycle, helping prevent potential conflicts.

Free Software Included with Each Board

Driver routines, sample programs, and a demonstration software program are included with each board. Drivers are supplied in Pascal, and as "C" source code which may be linked to programs written in Microsoft C, Assembler, or QuickBASIC. Sample programs make it easy to understand how to use the driver commands. A complete demonstration program is supplied which allows users to quickly start using the board. A screen display emulates a Digital Readout with one window for each of the 4 channels.

Programming is facilitated by a Programmable Interrupt Controller included on board. The encoder interface board can generate an interrupt when an index pulse occurs, at an overflow/underflow condition, or when the count reaches a pre-set value.



Ordering Information: **Fax-on-Demand Info: 203-483-9966 – FOD#5512**

#ESH 251	1-Channel (Quadrature) Encoder Input Board	**$575**
#ESH 252	2-Channel (Quadrature) Encoder Input Board	**$675**
#ESH 253	3-Channel (Quadrature) Encoder Input Board	**$775**
#ESH 254	4-Channel (Quadrature) Encoder Input Board	**$875**
#ESH 250LV	LabVIEW Driver Library (VI & LLB for Win 3.x/95, 16/32-bit)	**$295**
#ESH 250NT	Windows NT 4.x Driver Library (32-bit)	**$295**

The CyberResearch 100% Satisfaction Guarantee

You can order from CyberResearch with confidence. If you are not completely satisfied with your purchase, simply call our toll-free hotline within 30 days of receiving the item. A friendly customer service technician will arrange for a full refund, replacement, exchange, or credit. **No problem. No hassle.**

A 15% Restocking Charge will be applied to all exported product returns.

We reserve the right to refuse returns in the following cases:

Special order items: This refers to any items not currently listed in our Handbook, but specially requested by you.

Quantity, discount, dealer or OEM sales: If you are purchasing a large quantity of an item, we assume that you have previously evaluated its suitability.

Items which have been damaged or defaced.

You're in Good Company with CyberResearch

CyberResearch is the choice of engineers & scientists worldwide. Here are some of our recent customers:

AeroJet Propulsion
AGFA
Alcoa Aluminum
Allen-Bradley
Allied Signal Aerospace
American Dental Association
American Electric Power
AT&T
Amoco
AMP
BASF
Babcock & Wilcox
Bailey Controls
Batman & Robin
Battelle
Baxter Healthcare
Bayer
Becton Dickinson
Bell Atlantic
Bethlehem Steel
B. F. Goodrich
Boeing Aircraft
Boeing Helicopters
Boeing Defense & Space
Bosch
BP America
Bridgestone/Firestone
Briggs & Stratton
Bristol-Myers Squibb
Brookhaven National Lab
Cessna Aircraft
C.I.A.
Compaq Computer
Computer Sciences Corp.
Cummins Engine Company
Dartmouth Medical
Delco Remy
Digital Equipment Corp.
Walt Disney Imagineering
Dow Chemical
C. S. Draper Labs
Dresser Industries
Duracell
Eaton Corp.
EDO Barnes Eng.
EG&G
E. I. DuPont de Nemours
Eli Lilly & Company
Electric Boat Submarines
Exxon
F.A.A. (Fed. Aviation Admin.)
F.B.I.
Fermi National Lab
Ford Motor Company
Foster Wheeler
Fort George Mead
Fujitsu
Gateway
General Dynamics
General Electric
General Motors
Georgia Pacific
Gilbarco
Goodyear Tire & Rubber
Grumman Aerospace
G.T.E.
Harris
Hewlett Packard
Hoechst Celanese
Honda
Honeywell
Howmet Corp.
Hughes Aircraft
Hughes Missile Systems
IBM
Intel
Ingersoll Rand
ITT Aerospace
Jet Propulsion Laboratory
Johnson & Johnson
Kodak (Eastman)
Lawrence Livermore Labs
Lear Astronics / Lear Jet
Litton
Lockheed Martin
Loral Space Systems
Los Alamos National Lab
Lucent Technologies
Martin Marietta
Matsushita
Maxtor
Maytag
McDonnell Douglas
Medtronic
Milliken
Millipore
Milton Roy Company
Mitsubishi
Motorola
Monsanto Chemical
NASA Ames Research Ctr
NASA Goddard Space Flight Ctr
NASA Johnson Space Center
NASA Kennedy Space Center
NASA Langley Research Ctr.
NASA Lewis Research Center
NASA Marshall Space Center
NBC Broadcasting
National Bureau of Standards
N.C.R. (Nat'l Cash Register)
National Inst. of Health
Nat'l Institute of Standards & Technology (NIST)
N.O.A.A.
National Radio Astronomy Observatory
National Weather Service
Naval Air Station
Naval Air Warfare Center
Naval Oceanographic Center
Naval Research Lab
Naval Surface Warfare Center
Naval Undersea Warfare Ctr
Naval Ordinance Center
Norfolk Southern Rail
Northrop Grumman
Oil Gear
Olin Aerospace
Orbital Sciences Corp
Osram Sylvania
Owens Corning
Perkin Elmer
Philips Elmet
Polaroid
Pratt & Whitney Aircraft
Proctor & Gamble
R. R. Donnelley & Sons
Radio Netherlands
Raytheon
Rockwell International
Sandia National Labs
Sanyo
Schlumberger
Seagate Technologies
Sega
Sherwin Williams
Siemens
Sony
Stanley Tools
TDK
Tech. Museum of Innovation
Teleco Oilfield Services
Tennessee Valley Authority
Textron Defense
Texas Instruments
Texaco
3M
TRW
Union Carbide
Unisys
United Airlines
United Technologies
US Army
US Army Yuma Proving Ground
US Bureau of Mines
US Coast Guard
US Dept. of Transportation
USDA (Dept. of Agriculture)
US Dept. of Commerce
US Dept. of Defense
US Dept. of Energy
US Geological Survey
US Postal Service
US Steel
V. A. Medical Center
Visa
Warner Brothers
The Weather Channel
Western Digital
Westvaco
Westinghouse
Weyerhaeuser
Whirlpool
Woods Hole Oceanographic Institute
W. R. Grace
Xerox
Zenith

and thousands of others over 14 years...

Colleges & Universities:

U. of Alabama
U. of Alaska
U. of Arizona
U. of Arkansas
Auburn U.
Baylor U.
Boston U.
Brown U.
Brigham Young U.
Bradley
U. of Buffalo
U. of California: UCBerkeley, UCD, UCI, UCR, UCLA, UCSB, UCSD, UCSF
Cal. Polytechnic U.
Cal. Inst. of Tech.
Carnegie Mellon U.
Case Western R. U.
U. Central Fla.
U. of Chicago
U. of Cincinnati
The Citadel
City Coll. of N.Y.
Clemson U.
U. of Colorado
U. of Conn.
Cornell U.
U. of Dayton
U. of Delaware
U. of Denver
Drexel U.
U. of Florida
Florida Atlantic U.
Florida State U.
U. of Georgia
Georgia Inst. Tech.
U. of Hawaii
Harvard U.
U. of Idaho
U. of Illinois
U. of Indiana
U. of Iowa
Johns Hopkins U.
U. of Kansas
U. of Kentucky
Lowell U.
Louisiana State U.
U. of Louisville
Loyola U.
U. of Maryland
U. Massachusetts
McGill U.
U. of Miami
U. of Michigan
Michigan Tech
M.I.T.
U. of Minnesota
U. of Mississippi
U. of Missouri
U. of Montana
Naval PGS
U. of Nebraska
U. of New Haven
U. of New Mexico
N.Y.U.
U. of Nevada
U. North Carolina
U. of North Dakota
Northeastern U.
U. of N. Colorado
U. Northern Iowa
Northwestern U.
Notre Dame
Ohio State U.
U. of Oklahoma
U. of Pennsylvania
Penn State U.
U. of Pittsburgh
Princeton U.
U. of Puget Sound
Purdue U.
Rensselaer U.
U. of Rhode Island
Rutgers U.
San Francisco State U.
U. of South Carolina
U. of S. California
U. of S. Florida
U of S. Maine
U. S.W. Louisiana
U. Saskatchewan
S. Dakota State U.
Stanford U.
S.U.N.Y.
U. of Tennessee
U. of Texas
Texas A&M U.
U. of Utah
Utah State Univ.
U. of Vermont
U. of Virginia
U. of Washington
U. of West Florida
U. of West Virginia
Western Australia
U. of Wisconsin
Yale U.
& many, many others...

CyberResearch, Inc. Standard Terms and Conditions of Sale

All sales are subject to the Company's Standard Terms and Conditions of Sale as follows:

1.) Taxes: Prices are exclusive of all sales, use, and like taxes. Please add 6% Connecticut Sales Tax to all orders for delivery within the state of Connecticut. If your order is non-taxable, you must submit proof of tax-exempt status with your order.

2.) Prices: All prices are net, FOB Branford, Connecticut, USA. All transportation charges and insurance shall be paid by the customer. *A Non-refundable US$50.00 Export Handling Fee will be applied to each export order. A Non-Refundable US$75.00 Expediting Fee will be applied to orders when special expedited delivery is requested by customer.* All prices shown are subject to change without notice. Exact prices are determined by the prices in effect the day the order is accepted by CyberResearch, Inc. Unless otherwise stated by the customer, partial shipments will generate partial invoices. All program prices are one-time license fees. We are not able to provide "drop-shipments." A service fee of $25 will be applied to checks returned for any reason.

3.) Specifications: The specifications shown are subject to change without notice. The company reserves the right to make product improvements at any time. While CyberResearch has made every effort to ensure the accuracy of information contained in this handbook, we are not liable for printing errors or omissions.

4.) Software License Agreements: The use, transfer, & disclosure of computer programs and associated documentation distributed by CyberResearch, Inc. is governed by a separate License Agreement enclosed with the product. Customers who do not agree with the terms of the License Agreement may return the unopened media to CyberResearch, Inc. for a full refund. Copies of License Agreements are available upon request. The customer is advised that opening the diskette package constitutes acceptance of the terms of the License agreement. It is not possible for us to accept returns of software products which have been opened.

5.) Warranty: All of the products contained herein have been carefully chosen by our research staff based on our confidence in them and in the manufacturers who stand behind them. The manufacturers of the products contained herein warrant that their products will be free from defects in materials and workmanship for a period of time and under conditions specified. A copy of the Manufacturer's Warranty is available by writing our customer service department at:

CyberResearch, Inc., P. O. Box 9565, New Haven, CT 06535. To validate the Manufacturer's Warranty, buyer expressly agrees to follow its terms and conditions, including registration.

Note that round-trip shipping charges are generally not covered by any warranty. Many manufacturers will also impose a handling charge (typically $50-$75) on products returned under warranty which are diagnosed as "No Problem Found".

Other than the express warranties set forth above, CyberResearch, Inc. makes no other warranty, express or implied, regarding its products, including, without limitation, the implied warranty of merchantability and fitness for a particular purpose.

6.) Limitation of Liability: In no event shall CyberResearch, Inc. be liable for any defect in the software, for loss of or inadequacy of data of any kind, or for any direct, indirect, incidental, or consequential damages in connection with or arising out of the performance or use of any product furnished hereunder.

CyberResearch, Inc. liability shall in no event exceed the purchase price of the product furnished hereunder.

7.) Returns and Exchanges: Requests for return or exchange may be made by writing to or by calling our Customer Service Department within 30 days of invoice of merchandise. All exchanges require a new purchase order number to be issued unless paid by credit card or COD. A Return Merchandise Authorization Number (RMA #) will be issued when your request is approved. All products must be returned promptly, as the RMA number for any return automatically expires in 10 days.

Refused or unclaimed orders will have to pay the initial and subsequent shipping costs, on any shipping method, plus C.O.D. charges, each time.

Goods returned without a valid RMA number will be refused. To ensure that you receive proper credit, *please reference a valid RMA number on the outside of the package.* In order to qualify for a refund of product purchase price, the product must not have been damaged by the customer or by the common carrier chosen by the customer. All returned merchandise must be shipped freight-prepaid for return within 30 days of receipt in new, unused, and resellable condition, complete with all packaging materials, software, cables, accessories, and documentation. The Company reserves the right to refuse returns in the following cases: special order items; quantity, discount, dealer, or OEM sales; and damaged or defaced items. Credit cards will be credited upon receipt of correctly returned merchandise. C.O.D. orders will be processed as a merchandise credit; include a letter if you wish to request a refund by check. Allow 15 working days for refunds. **Transportation/shipping charges are not refundable** (even within 30 days). *A 15% Restocking Charge will be applied to all exported product returns.*

8.) Claims: A) *Inspect All Shipments Immediately Upon Receipt.* If you receive a shipment with obvious damage to cartons or missing cartons,

B) *Notify the Carrier Immediately.* Concealed damage or loss should be reported at once to the carrier and an inspection requested. CyberResearch is not responsible for packages left unattended for any period of time.

C) *Do not* return merchandise to us until notified by the carrier to do so. Retain all packaging materials including styrofoam peanuts, inner and outer cartons, labeling, etc. for inspection by the carrier — without this, your claim may be denied. With shipments properly packaged (as all shipments leaving our facility are), the ultimate responsibility for delivery in good condition rests with the carrier.

9.) Export: Regardless of any disclosure made by the purchaser to CyberResearch, Inc. of an ultimate destination of product, purchaser will not export, either directly or indirectly, any product or system incorporating such product without first obtaining a license from the U.S. Department of Commerce or any other department of the United States as required.

10.) General Provisions: These terms and conditions are governed by the laws of the State of Connecticut and will become binding only when an order is accepted by CyberResearch, Inc. The terms constitute the entire agreement between the parties with respect to the subject matter hereof. These terms and conditions will prevail notwithstanding any different, conflicting, or additional terms and conditions which may appear on any order submitted by the purchaser. Deviations from these terms and conditions are not valid unless confirmed in writing by an authorized officer of CyberResearch, Inc. **CyberResearch, Inc. Standard Terms and Conditions of Sale** are subject to change without notice — contact the Sales Department if an updated copy is required.

All trademarks & trade names used herein are copyrights of their respective holders. We apologize for any typographical errors—let us know if you find any.

CyberResearch Assistance: Toll-Free 1-800-341-2525 (USA) ☎ Tel: 203-483-8815 Fax: 203-483-9024
Applications Engineers: Mon-Fri, 9 AM-5 PM U.S. Eastern Time • **Internet Website:** http://www.cyberresearch.com • **Fax-on-Demand System:** 203-483-9966 • **BBS:** 203-488-8949

It's Easy to Order from CyberResearch

Call us TOLL FREE at 1-800-341-2525

1. Call toll-free 1-800-341-2525, or at 203-483-8815.

Call with your Purchase Order Number and list the part numbers you want for prompt, courteous service.

We accept Purchase Orders from:

- Government Agencies,
- Fortune 1000 companies,
- Universities and Hospitals,
- Companies which have previously established a credit account.

If you are listed by Dun & Bradstreet with a rating of 2B1 or better, you may qualify for credit terms for your repeat purchases. (net worth $1M+) Terms may be up to net 30 days. Otherwise, we require that your first order be processed using a credit card, prepaid by check, or COD.

If you are placing an order for a small business or for your personal use, we can accept your order COD-Company Check, or Prepaid with a check or credit card. We accept MasterCard, VISA, and the American Express Card. **We will pay the shipping charges within the USA (via UPS Ground) on all orders prepaid by check.**

We will accept applications for credit from regular repeat customers; please allow from 5 to 10 working days for processing of your application.

VISA MasterCard AMERICAN EXPRESS Card

Choose Your Carrier:

No Handling Charges within the USA

2. Fax it to us! 203-483-9024

This is a very fast and convenient way to send RFQs, Purchase Orders, Credit Applications, and requests for technical information. Avoid the possibility of miscommunication on the phone, don't waste time on hold, send it by fax!

3. Orders sent by mail should be addressed to:

CyberResearch, Inc.
P. O. Box 9565
New Haven, CT 06535-0565 USA

Orders sent by Fedex, UPS, etc. should be addressed to:

CyberResearch, Inc.
25 Business Park Drive
Branford, CT 06405 USA

Toll-Free USA Hotline

1-800-341-2525

Worldwide: 203-483-8815

Fax: 203-483-9024

Notice to International Customers:

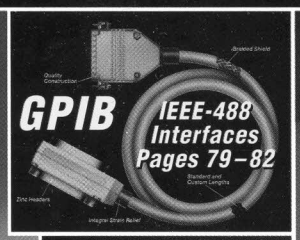
You can buy a majority of the leading brands direct from CyberResearch at low USA prices and *save 30 to 50%*. **Due to contractual restrictions, some products are not available for export to certain countries.** Please Fax your request for a quotation listing brand names, part numbers, and/or performance requirements. We will Fax back a prompt response.

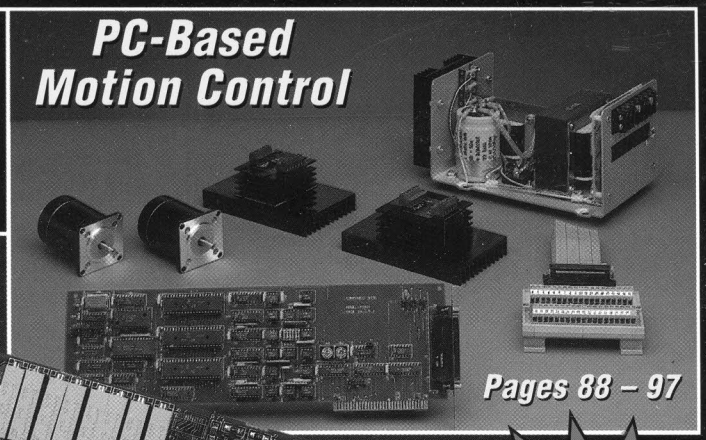
In a Hurry? Need to find the Right Solution FAST?

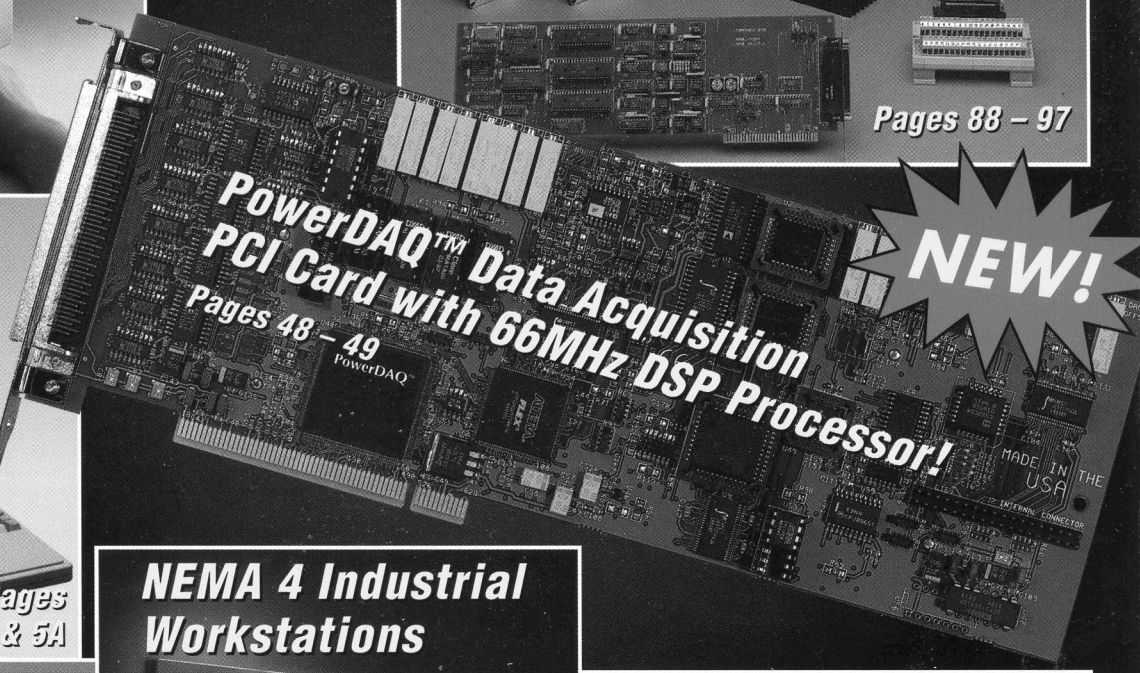
Give CyberResearch a call. We're the ***factory authorized*, one-stop-shopping source** for over 100 leading suppliers. By offering the broadest selection in *every* product category, we can provide you with unique, multi-vendor "open system" solutions that are not available from any one manufacturer.

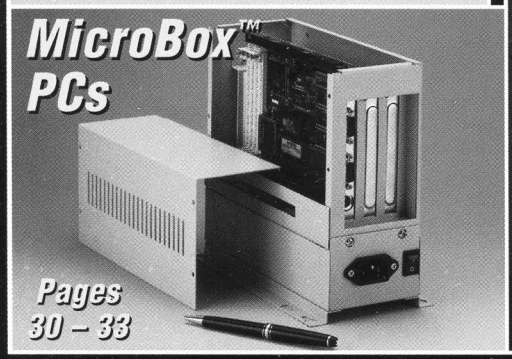
- **Toll-Free Application Engineering:** Our friendly and knowledgeable staff of experienced Application Engineers are standing-by ready to help you get your job done. They can help you make sense of the competing claims to find the product that best meets your needs. If we can't offer you the best solution, we will try to direct you to someone who can.
- With approved credit, we offer **same day shipment** on orders received by 2:00PM for items from our extensive inventory of popular DAS components.

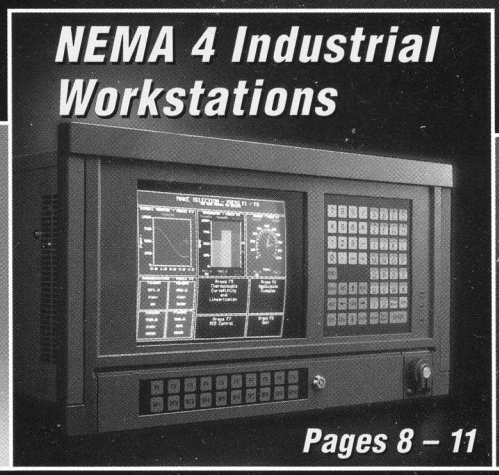
Designed, Written, Edited, and Produced by David Kone, David Ailes, David Picton, Mike Mathis, and Bob Molloy

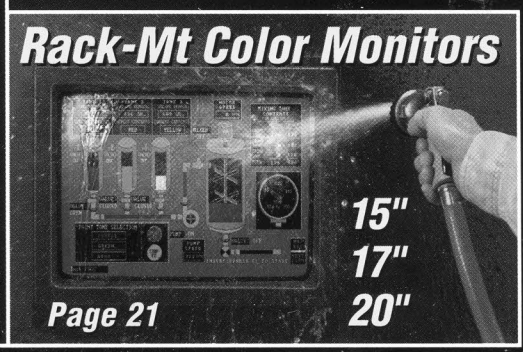












This *Preview* edition of the Handbook represents only a portion of our total offering.
Be sure to request a Free copy of our full-line, 204-page 1998 *PC Systems Handbook*.

The CyberResearch 100% Satisfaction Guarantee

You can order from CyberResearch with confidence. If you are not completely satisfied with your purchase, simply call our toll-free hotline within 30 days of receiving the item. A friendly customer service technician will arrange for a full refund, replacement, exchange, or credit. **No problem. No hassle.** See page 98 for complete text.

Toll-Free Hotline
1-800-341-2525
Worldwide
203-483-8815
Fax: 203-483-9024

CyberResearch, Inc.
25 Business Park Drive
Branford, CT 06405 USA

Mailing Address:
Post Office Box 9565
New Haven, CT 06535-0565 USA

Telephone (Worldwide): 203-483-8815
Fax: 203-483-9024
Fax-on-Demand System: 203-483-9966
BBS (Bulletin Board System): 203-488-8949
Internet Site: www.cyberresearch.com
E-mail: info@cyberresearch.com
Toll-Free Hotline: 1-800-341-2525 (USA)

PC-Based Data Acquisition | **Rack-Mount Computers** | **Personal Instrumentation** | **Data Logging** | **Serial Communications** | **Motion Control**

Complete PC System Solutions for Scientists & Engineers

Printed in the USA